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PROCEEDINGS

OF

THE SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

SURVEY DEPARTMENT.

PART I.
INDIA.

PART II.
BOMBAY AND MADRAS.

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Members of the Sub-Committee at Simla.

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Lieut.-Colonel R. H. THUILLIER, R.E., *Departmental Member.*

Sir EDWARD BUCK, Kt., C.I.E., *Departmental Member.*

Sir CHARLES A. TURNER, Kt., C.I.E., *President.*

SURVEY DEPARTMENT.

PART I.

Errata.

Page 14.—Under the Head "*Assistant Surveyors*" in the 2nd grade, for "*160—8—210*" read "*160—8—200.*"

" *17.*—Tabular Statement, column No. 2, under the Head "*Non-gazetted*" for "*22 Assistant Surveyors, 3rd grade, R120—8—160*" read "*24 Assistant Surveyors, &c.*"

" *28.*—Left hand column, 20th line from the bottom, read "*who*" for "*whom.*"

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PROCEEDINGS

OF

THE SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

INDIA.
Survey.

Section I.—Note by the Sub-Committee.

The following extract from the Report of 1877-78 explains the present constitution of the Department :—"On the 1st January 1878, the three branches of the Survey Department, *viz.*, the Great Trigonometrical, the Topographical and the Revenue, were amalgamated. Up to that time they had been virtually separate Departments, each with its own cadre of officers and establishments of European and Native Surveyors and its own Superintendent. When the three Departments were first formed—which was at different times—the duties which each had to perform were essentially distinct. The Trigonometrical Survey was required to furnish the basis on which all Surveys of interior details were to rest and the framework within which they were to be fitted and connected together. The Topographical and Revenue Surveys were to furnish the interior details; the former was to survey—by the method of plane-tabling—the whole country including Native States and British territory, with the exception of the richer British Districts paying a large revenue; these districts devolved on the latter and were surveyed on a larger scale and on a different *modus operandi*, which was better suited for the determination of exact areas in order to meet the requirements of the Revenue and Settlement officers. In course of time, however, work which was originally intended to be executed by only one of the three Departments had come to be undertaken to a greater or less extent by the others. The Great Trigonometrical Survey was approaching completion, and for many years a large proportion of its Surveyors and higher officers had been employed in Topographical surveying on various scales, both the small which are required for preliminary survey and reconnaissance, and the large which are needed for elaborated and detailed survey. The Topographical Department, though originally intended for the primary general survey of India, had similarly to undertake detailed surveys on large as well as preliminary surveys on small scales. The Revenue Department which was originally intended for surveying the rich British Districts in the plains of India, leaving the delineation of all hilly country and difficult ground generally to the Topographical, had for some years been largely employed in the Topography of Hill Districts on a Trigonometrical basis. Thus the duties of the three Departments had become gradually intermixed * * *. So long as three separate Departments separately administered existed, the transfer of a Surveyor from one to the other, though very often desirable in the interests of the public service, was attended with so many difficulties that it was scarcely ever carried out * . *. The time had obviously arrived for combining the three separate cadres * * * into a single cadre."

The work of the Survey Department is thus described in the same report. It "may be broadly divided into three classes, excluding the principal triangulation, the geodetic operations, the tidal investigations and much miscellaneous work of a scientific nature which the Department is called upon from time to time to perform. The three classes of ordinary survey are, *1st*, the General survey on the standard scale of 1 inch to the mile of the hilly, more rugged and poorer portions of the British Districts and of the whole of the Native States; *2ndly*, the Mauzawar or village survey on the scale of 4 inches to the mile of the richer portions of British Districts as an end to the operations of the Settlement Surveys; *3rdly*, the Cadastral or field survey on the scale of 16 inches to the mile of British villages in supersession of the field measurements of the Settlement Surveys." At the date of this report the agency employed in the operations was mixed European and Native. In the Topographical Survey the European element slightly predominated and took the greater share of the plane-tabling in Hill Districts and the lesser share in the plains. In the village or Mauzawar survey the proportion was about 1 European to 4 Native Surveyors. As a rule the whole of the plane-tabling was done by the Natives, the Europeans being employed on the traverses and calculations, and in supervising and checking the work of the Natives. In the Cadastral survey the proportion was about 1 European Surveyor to 4 Native Surveyors and 17 Measuring Amíns. The Europeans were wholly employed on the traverses and calculations and in supervising the Natives and testing their work by running check lines over it. The Department has of late years also taken charge of Patwári Surveys, in which the Subordinate staff employed is, as its name implies, to a great extent made up of the Native Revenue agency.

The staff of the Department is as follows :—

(a) ADMINISTRATIVE.

		Salary. R
1	Surveyor-General with a salary of	3,000
1	Deputy Surveyor-General, Revenue, with salary of	2,200
1	" " Trigonometrical, with a salary of	2,000
3	Total.	

(b) SENIOR DIVISION.

Deputy Superintendents.

3	Officers, 1st Grade, on	1,600
8	" 2nd " on	1,300
10	" 3rd " on	1,000
11	" 4th " on	850

Assistant Superintendents.

11	Officers, 1st Grade, on	600
6	" 2nd " on	500
49	Total.	
	Civilian Probationers	400

(c) JUNIOR DIVISION.

Surveyors.

8	Officers, 1st Grade, on	500
10	" 2nd " on	400
14	" 3rd " on	350
18	" 4th " on	300

Assistant Surveyors.

41	Officers, 1st Grade, on	200—250
22	" 2nd " on	160—200
24	" 3rd " on	120—160
137	Total.	

(d) SUB-SURVEYORS.

In this grade there are nearly 500 posts on salaries ranging from R10 to 100.

The officers of the Senior Division are partly Military and partly Civil, the proportion being from time to time determined by the Surveyor-General, subject to the control of Government. It is stated that the average proportion for the last ten years has been in every three appointments—two Military officers to one Civilian. At the time of this enquiry 37 out of 49 posts in the Administrative staff and Senior Division were held by Military officers and 12 by civilians, of whom 9 had been promoted from the Lower Division, and three had been specially appointed. Three posts were vacant.

The Royal Engineer officers excepting those on the Administrative staff, and in the 1st Grade of Deputy Superintendents, receive, in addition to the substantive pay of the grades abovementioned, net Military pay according to the following scale :—

	R	a.	p.
Colonels	304	6	0
Lieutenant-Colonels	243	8	0
Majors	182	10	0
Captains	140	0	0
Lieutenants	70	0	0

The 3 Administrative Officers are non-domiciled Europeans. Of the 46 officers in the Senior Division, 39 are non-domiciled Europeans, 6 are domiciled Europeans and one is a Eurasian. In the Junior Division, there are 5 non-domiciled Europeans, 93 domiciled Europeans, 33 Eurasians, 3 Hindus and 1 Mahomedan. Two of the appointments in this division are vacant. Of the Sub-Surveyors only two (Hindus) receive salaries amounting to R100 and upwards and the salary of no Sub-Surveyor exceeds R110.

Candidates are admitted into the Senior Division by the Government of India on the recommendation of the Surveyor General. No Military officer is admitted unless he belongs to the Corps of Royal Engineers or the Staff Corps. Royal Engineer officers are appointed substantively as 2nd Grade Assistant Superintendents without any Departmental examination. Staff Corps officers are appointed as Probationers for one year which may be extended to two years, if they have undergone a preliminary examination in Arithmetic, including Logarithmic calculations and Mensuration of Surfaces, Elementary Geometry, the first Four Books of Euclid, Algebra as far as Quadratic Equations inclusive, the Elements of Plane Trigonometry and Topographical, Mechanical or Civil drawing, or hold certificates of qualifications granted at the Institutions of Sandhurst and Woolwich or the Staff College or Civil Engineering Colleges, or have passed an examination in surveying according to the Army standard.

At the close of the period of probation the Probationer must undergo an examination to test: (1) his ability to execute, unassisted, the survey of a small area of country including the computation and entire mapping involved in the same, (2) his knowledge of the use and adjustment of all the instruments employed in the Department, (3) his acquaintance with the details of the several calculations for the reduction of observations which are commonly used in the Survey Department, (4) his possession of a sufficient knowledge of the elements of Practical Astronomy for ascertaining true azimuth latitude and longitude, and (5) his acquaintance with the rules in force for the general conduct of the Survey Establishments. Every candidate is also required to produce a certificate of having passed the Higher Standard examination in the Vernacular language prescribed by the Government of India.

Civilians are promoted with the approval of the Government of India from the Lower Division to the Senior Division without examination. The civil element in the Department is, it is stated, almost entirely composed of such officers. Civilians are also appointed without examination to the Senior Division either by the Secretary of State or by the Government of India with the sanction of the Secretary of State when they possess special qualifications which are required for any particular post. Civilians may be appointed to the Senior Division by the Government of India subject to the following qualifications:—The candidate must produce (1) a medical certificate of bodily health, strength, activity, and good eyesight and of fitness in these respects to perform the duties required in the Survey Department, (2) proof that he is not less than eighteen years of age, nor more than twenty-five, and (3) testimonials of good moral character. A candidate who has not graduated at some recognised University or Civil Engineering College is required to pass an examination in Dictation, Arithmetic and Geometry, Latin, French, or Hindustani, History and Geography prescribed by G.O., P.C., No. 244, dated 19th April 1851. Every civilian candidate before admission on probation is required to pass an examination to test the possession by him of a fair colloquial knowledge of Hindustani and also a professional examination by the Lower Standard similar to that required in the case of Staff Corps candidates. A candidate must also be able to write and print very clearly and well and must possess fair skill as a Topographical and Military Draftsman. A knowledge of ground or hill sketching and shading is specially required.

A civilian Probationer, before he is confirmed in the Senior Division must produce certificates from his official superiors of having, during his period of probation, exhibited intelligence, good temper and discretion in his intercourse both with his superiors and his subordinates, especially his Native subordinates, and with the Natives of the part of the country in which he has been employed; that he has also shown capacity to command his subordinates, personal energy and fertility of resource and capability of overcoming difficulties, where such have occurred, and that he has continued to be of good moral character, and enjoys health and physical strength. He must also produce certificates from the immediate official superiors under whom he has served during his period of probation (1) that he possesses intelligence and aptness for his professional duties, and (2) that he has sufficient knowledge of practical Surveying and of Topographical and Military drawing for the purposes of the Department. A candidate must further before confirmation pass an examination in Hindustani by the Lower Standard, and the same professional examination by the Higher Standard as is prescribed for Staff Corps candidates.

Before promotion to the 1st Grade of Assistant Superintendents, a civilian Probationer is required to pass a Vernacular examination by the Higher Standard.

Appointments to the Junior Division are made by the Surveyor-General by selection from candidates who fulfil certain conditions, and have passed the prescribed qualifying examination. A candidate must be over eighteen and under twenty-five years of age. He must be unmarried and "not likely to be soon married;" but this last condition does not, it is stated, refer to candidates of pure Asiatic origin. He must produce certificates of age, moral character, education, soundness of health and good eyesight, and forward with his application for admission to the examination specimens of drawing. If selected, he must enter into a bond agreeing not to demand his discharge for three years from the date of joining the Survey of India, and never during the field season, subject to the penalty, in case he should insist on his discharge against the tenor of the agreement, of forfeiting to Government a sum equal to one-half of the whole amount he may actually have received in the shape of salary or allowances of any kind. Assistant Surveyors of the Junior Division are considered to forfeit their appointments on marrying, unless they possess or acquire by their marriage sufficient means to raise their incomes to ₹200 a month, exclusive of local and travelling allowances.

The subjects of the examination for candidates for the Junior Division are:—

1. Arithmetic (Vulgar and Decimal Fractions and Proportion).
2. Algebra (Square and Cube Roots and Surds, Arithmetical and Geometrical Progression, Simple and Quadratic Equations and Problems, Binomial theorem).
3. Geometry (first four and 6th Books of Euclid with Problems).
4. Mensuration (Areas of Plane figures).
5. Second part of Mathematics (Analytical Plane Trigonometry, including the Solution of Triangles, the use of Logarithm tables, Heights and Distances).
6. Writing and Drawing (handwriting and writing from Dictation, Military or Topographical drawing, Map and Plan drawing, Freehand drawing, Hand Printing or Map writing).

India.

Survey.

Section I.

Promotions in the Senior Division are, as a rule, made by seniority except in the case of proved incompetency; promotions in the Junior Division are usually made by seniority, but proof is required of the possession of adequate qualifications.

Military officers, excepting Royal Engineer officers who have elected continuous Indian service, obtain furlough under the Military Furlough Rules. Royal Engineers who have elected continuous Indian service enjoy furlough under the Civil Leave Rules.

Civilian officers appointed by the Secretary of State or with his special permission, as also civilian officers whose names are entered in Schedule B of the Civil Leave Code, are entitled to the more favorable leave rules. All other civilian officers are entitled to furlough under the rules of the Code relating to Uncovenanted officers.

The pensions of the Military officers are governed by Military rules; those of the civilian officers by the rules of the Civil Pension Code.

The civilian officers of the Senior Division cannot count as service towards pension any part of their furlough as is the case with officers of the Geological Department, of the Public Works Department, and the Forest Department, who are appointed by the Secretary of State; but all civilian officers, both of the Senior and Junior Divisions, come under the ordinary rules as to pensionary service for Uncovenanted officers generally.

As to the technical and professional requirements of the Department, it may be observed that the Survey Department is charged with the preparation of a Topographical and Cadastral Survey of India, and in Northern India to a certain extent with the work of Revenue Settlement, besides other scientific work, such as geodetic and tidal researches, gravity, variation, &c.

For a superior officer in the Department moral and physical as well as mental qualities are requisite. Energy and self-reliance, fertility of resource and tact in controlling a large staff, physical endurance and artistic skill in Topographical and Geographical delineation, an advanced knowledge of Mathematics, and a fair acquaintance with the exact sciences, are necessary in all officers of the Controlling grades. For special scientific work, experts are required, and these are generally selected for special posts. In the operations of the Department connected with the Land Revenue, a knowledge of Revenue Law and Procedure is also, to a certain extent, essential. Similar qualities are in a less degree required of officers in the Lower Division.

The classes who ordinarily seek employment in the Department are officers of the Royal Engineers or Staff Corps, specialists appointed in England, and those classes of Europeans and Natives who ordinarily seek appointments in the public service in India.

The Departmental member considers that the Senior Division of the service should be officered mainly by the Military class, and he alludes to the practice of the leading European nations as justifying this opinion. He notes that in India it has been found necessary to place survey parties in the field under military executive officers for co-operation with military forces and political missions; and he states that the calls for military survey officers during recent years have proved that it is difficult, even with the present strength of the Military staff, to meet the requirements where military operations on any extensive scale are being carried on across the frontier. He would, therefore, make no reduction in the present proportion of the Military element. He would also maintain the present proportion of the civil element to afford the means of rewarding meritorious officers of the Junior Division, and to provide for the appointment of specialists when required. Seeing that some of the officers must necessarily be kept for special duties, he would so select the remaining officers that they might be capable of undertaking any work that the Department might be called upon to perform. This quality of general usefulness, he believs, is far more common among Military and Civil European officers than among Natives, if, as he doubts, Natives can be found who have received the required scientific education and possess the necessary qualifications; he would therefore restrict appointments in the Senior Division to officers of European birth and education.

The Junior or Subordinate Division has been hitherto officered for the most part by Europeans domiciled in India and Eurasians, of whom many have passed the Matriculation Examination of the Indian Universities. The Departmental member asserts that the experiment of employing Natives in this branch has been tried in former years to a limited extent, but with so little success that it was not continued. He adds that as the Government has after much correspondence directed the admission of Natives of India to this branch, it is unnecessary to re-open the question of the comparative capacity of the European or Eurasian and of the Native for rendering efficient service. In the lowest Division, that of Sub-Surveyors, he states that the services of Natives have been extensively utilised in practical survey work in the field under European supervision, and that the work which has been, and is being, performed by this class of men is all that can be wished.

In considering the qualifications necessary for an officer in the higher Division of the Survey, it will be necessary to bear in mind the responsibility of the duties with which he is ordinarily charged.

Lieutenant-Colonel Coddington, Deputy Superintendent of Survey, who has been engaged in the Revenue Branch of the Survey for over twenty-five years, informed the Sub-Committee that the annual expenditure of a Mauzawar or Topographical party, such as he had usually held charge of, amounts to from R60,000 to R70,000; that it usually consists of from four to

six European or Eurasian Assistants, from twenty-five to thirty Sub-Surveyors, and about two hundred and fifty measuring khalasies; and that the Executive officer has direct charge under the Deputy Surveyor-General of the conduct of the survey, and is held responsible for the drawing and payment of all salaries and the preparation of all maps, plans, records and returns. He stated that during the field season the establishment of a Topographical party is divided into two or more sections; that the Senior Assistants of the party are placed in direct charge of these sections, and that they are often unavoidably detached from the control of the Executive officer who may have to supervise work in two or more districts simultaneously; and that they are often so situated that they must act on their own resources and responsibility, enter into correspondence with civil officers and control the Sub-Surveyors' squads, for the proper working of which they are held responsible.

Major Sandeman, Deputy Superintendent of Survey, who had been engaged for four years in making a Cadastral survey in the Gorakhpur District, estimated the annual expenditure of his party as close on R1,60,000. He stated that this party is divided into three camps, of which the traverse camp under a European Surveyor has an establishment of about three hundred men, and the two Cadastral camps, each under a European Surveyor, have each an establishment of about five hundred men.

For some years prior to 1884 the Junior Branch of the Survey had been exclusively filled by persons of European or Eurasian parentage. In that year, however, the Government of India informed the Surveyor-General in a letter, No. 222S., dated 12th June 1884, of its determination that in future Natives should be admitted to the Junior Branch of the Survey Department, and requested that officer to confer with the Secretary to Government in the Revenue and Agricultural Department as to the manner in which effect could, without prejudice to Survey operations, be given to this decision, as to the qualifications to be required of Native candidates, and as to the proportions which in future the Native might be allowed to bear to the European element in the Department. Pending the settlement of this question appointments to the Junior Branch without the previous sanction of the Government of India were prohibited.

In a letter No. 213S.S., dated 16th June 1884, Colonel DePrée replied that while no one had been a more staunch advocate for utilizing the services of Natives of India as detail Surveyors than he had been and still was, he considered that the Department had availed itself of those services to the full limit practicable. He added that for the command of large bodies of Survey establishments in the field or in office, his experience showed that only Europeans possessed the necessary vigour of body, strength of character, and self-reliance.

He admitted that in the early days of a European Surveyor's career it might be said that the highly-trained Native Sub-Surveyor working alongside of him did as good a day's mapping at half the cost. But he asserted that while the European was gaining knowledge and experience for the eventual assumption of more commanding duties, the Native would never be fit for anything more than practising the art of detail surveying he had then attained to. He ventured to deny that it would be an economical measure to promote the Native to enhanced emoluments and to call him an Assistant Surveyor. Whether it would be a practically successful measure to enlist highly educated Natives and to introduce them into the ranks hitherto exclusively filled by Europeans, he allowed he had no experience to guide him in forming an opinion; but he conjectured that the hard work, drudgery and exposure of field work would not commend itself to these persons. Whether their employment, if practicable, would result in a saving worth the consideration of the Government of India enforced at the expense of much dissatisfaction of their well-tried European Surveyors, he professed that he could not at the moment realize.

On the 21st July 1884 in a letter No. 325 S., the Government of India communicated to the Surveyor-General some of the reasons which influenced it in requiring the admission of Natives to the Junior Branch of the Survey: firstly, that the Cadastral surveys of the Department were so expensive that the Local Governments were becoming unwilling to utilize the Department; secondly, that the cost of the Topographical survey was believed to be in some cases unduly high on account of the cost of the European staff; thirdly, that in view of the probable contraction of the work at no distant date, it was undesirable to add European officials on the existing scale to the subordinate staff, the members of which were even then more or less discontented with their prospects; and fourthly, that the Government of India believed that educated or trained Natives could be found who were competent to perform all the duties of the subordinate staff, and that as the competence of such Natives had not been made the subject of trial, the presumption of incompetence could not be admitted.

The Government of India consequently directed the Surveyor-General to submit definite proposals for the gradual admission of a certain number of Natives on the subordinate staff in such a manner as to reduce permanently the number of appointments open to Europeans. It was intimated that the chief points for consideration were the extent to which Native agency should be substituted for European, the designation of the appointments to be held by Natives, and the pay they should receive. The Government of India declared its main object to be that the experiment should have a fair trial, and that for the time being it would be sufficient that one out of every three vacancies should be given to a Native. It appears that before the letter of 21st July 1884 had been despatched, the Surveyor-General had, on 18th July, applied for the sanction of Government to fill three vacancies in the Junior Branch by the appointment of three

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Europeans who had already passed the prescribed examination. In sanctioning these appointments on 1st August 1884, the Government of India declared that the next vacancy should be reserved for a Native. A copy of the papers which had been set to one of the European candidates, and copies of the memorandum of instructions issued to intending candidates were at the same time called for in order that they might be sent to the Directors of Public Instruction, North-Western Provinces and Oudh and the Punjab, who were to be invited to name young Natives willing to enter the Department and who could comply with the conditions of entrance.

Colonel DePrée did not reply to the letters of the 21st July and 1st August 1884 until the 6th October 1884. In his letter No. 832 S.S., he informed the Government that he had in the interval consulted several experienced officers of the Survey and had found a general consensus of opinion that Natives, however capable they might be to work under the orders of superior officers, were not likely to possess such vigour of character as would fit them for positions involving the exercise of command over others under the conditions of service in the field, where promptitude and decision were often required, as well as a power of management, all of which, he observed, were characteristics of the European but not of the Native. He asserted that in days gone by Native Surveyors had been employed in the Revenue and Trigonometrical Survey, but with such little success that the project had been allowed to drop entirely; and he suggested that if the experiment proposed by the Government confirmed the views expressed, it would be costly, inasmuch as Natives incompetent for the higher offices would continue to perform on enhanced pay the inferior duties which they were at the date of his letter performing very efficiently on a smaller scale of pay. He recommended that the rules applicable to the admission and promotion of Europeans should be applied to Natives with the following alterations and additions: that Natives should receive two-thirds of the salary and two-thirds of the travelling allowances drawn by Europeans; that Native candidates should give proof of their physical power and activity by being required to walk or ride an ordinary march of 12 miles; and that a knowledge of colloquial English and the power of correctly expressing themselves in writing in that language should be exacted of them.

These he stated were his proposals with respect to young Natives, probably graduates, or at least students, of Indian Universities; but he mentioned that the Department already possessed a class of Natives who were very capable workmen, the Sub-Surveyors, whose pay ranged between ₹80 and ₹100; and with the permission of Government he proposed to admit this class also to the Junior Branch on rules which he would prepare, if necessary, and in the ratio of one Sub-Surveyor to two collegians.

On the 11th December 1884, the Government of India in its letter, No. 683 S—103-13, reminded the Surveyor-General of its determination that every fourth appointment should be filled by a Native (it had originally suggested every third), and that it only remained to settle the conditions on which Natives should be admitted and the terms on which they should serve. The Governor General in Council agreed that as to admission and promotion, no distinction should be made between Europeans and Natives; but bearing in mind that the officers already serving in the Junior Branch, whether of pure European or Eurasian parentage, were for the most part Natives of India within the Statutory definition, His Excellency in Council did not consider it desirable to make any distinction in the matter of salary and travelling allowance between them and officers of purely Indian extraction, and decided that the scales then in force should be applicable to all officers of the Junior Branch.

The Surveyor-General was directed to issue information to the Directors of Public Instruction for circulation to Heads of Colleges and Educational officers respecting the emoluments of the officers of the Junior Branch and the qualifications required of candidates, and at the same time to issue a notice inviting Native candidates to appear at an examination to be held on a date to be specified for filling the appointments then vacant. It was intimated that no candidate should be admitted to the examination who had not passed at least the Matriculation examination, and that the question of raising the standard might thereafter be reconsidered.

The Government of India approved of the proposal to promote Sub-Surveyors subject to the condition that the persons in question were sufficiently well educated for the posts to which it was proposed to advance them, but insisted that they should be required to pass the examination to which other Native candidates were subjected. It was left to the Surveyor-General to determine whether the examination should be strictly competitive, or whether power should be reserved to make a selection from candidates who had obtained a qualifying minimum of marks.

These instructions were carried out. The applications of twenty-seven candidates were registered, but only seven presented themselves for examination; of these one was already employed as a Computer in the Department, another was the Librarian of the Calcutta Madrassa, the others were collegians or pupils of the Civil Engineering establishments.

In his letter No. 558 S.S., dated 22nd July 1885, the Surveyor-General informed the Government of India of the result of the examination which was carried out in accordance with the usual practice of the Department; the Mathematical papers being examined by the Computing Office and the marks for drawing being assigned by the Assistant Surveyor-General in charge of the Drawing Office. It appeared that while some of the candidates were pronounced sufficiently qualified in Mathematics, all had failed to submit any passable drawings. The Surveyor-General observed: "It is obvious that map-drawing forms one of the essentials of a Surveyor's duty. It is one invariably exacted from all candidates, and no candidate has hitherto presumed

to submit to me such nominal marks as four or five out of a maximum of two hundred and fifty. I am therefore compelled to decide that all the candidates have failed." The Surveyor-General further stated that he had intimated to the candidates that they might present themselves again for examination at the end of six months, but that at the same time he had informed them that they must be prepared to accept such modified terms as to pay and status as might be decided on in the future. Colonel DePrée had not received authority from the Government of India to make this announcement; but in reporting that he had done so, he explained that he could not but think that the existing rules called for revision. Observing that so far the orders of Government had not resulted in success, he added that, had it been otherwise, no tangible advantage would have been attained beyond the assertion of the principle of the absolute equality of Natives with Europeans; for as both classes were under existing orders to be paid alike, the object of economy would not have been secured. He appended to his letter a list of the Sub-Surveyors, and remarked as follows: "Many of these are highly capable men, who have done good service, and are so doing it at this time, men of every race, and the great number of them ready to serve in any country when their services are required, some being at this time near Herat, another with the Gilgit Mission and others variously employed beyond the British Frontiers;" and he suggested that the object of the Government would be effected if one in fifty of these men were selected as possessing unusual talent and high moral qualifications and subjected to a qualifying examination and not to such a test as collegians only could be expected to pass.

The Government of India in its letter, No. 428 S., dated 10th September 1885, refused to regard the results of the examination as conclusive; declined to sanction any relaxation of the rules prescribing the educational standard, maintained that with due publicity qualified Native candidates would be forthcoming, and offered to procure candidates through the Provincial Departments of Education, Agriculture, or Settlement.

At the same time the Government of India acknowledged that in order to effect economy, the expediency of creating a separate branch for Native Surveyors should be considered, and invited the Surveyor-General to submit a scheme with that object, intimating that appointments to the European grade would then be stopped until a certain number of Natives had been appointed to the intermediate grade. Until this question had been settled, the Government of India declined to sanction any proposal for the appointment of a European unless special ground could be shown for so doing.

The Surveyor-General, in his letter No. 2688 S., dated 21st December 1885, submitted a scheme for the creation of an intermediate grade. He recommended that the pay should be one-half, and not, as originally proposed, two-thirds of that received by European Surveyors of the Junior Branch; and he stated that while the scheme he had prepared provided for the admission of men who had satisfied the usual Collegiate tests, it was not proposed to examine the candidates further, but to demand proof of the possession of knowledge of or a natural taste for map-drawing, and to base the final selection on the nomination and recommendation of officials or persons of position who would be invited to furnish the Surveyor-General with their personal opinions of the individual; and that only young men of undoubted vigour would be chosen.

In this letter the Surveyor-General mentioned that since the examination already referred to, no more Native candidates had offered themselves, and that the two vacancies on the list reserved for Natives still remained unfilled.

The abstinence of candidates from presenting themselves may possibly be explained by the uncertainty created by the Surveyor-General's announcement, not only as to the pay of Native Surveyors, but as to their status in the Department.

It will be remembered that among the objects aimed by the Government of India in substituting Native for European agency was the reduction of the cost of surveys. This, so far as the mere expenditure on salaries was concerned, might perhaps have been effected by the adoption of the Surveyor-General's scheme; but it would seem that doubts were entertained whether the salaries proposed would secure the services of Natives competent to discharge the duties which it was intended to entrust to them. Consequently, before accepting the scheme, the Government in a demi-official circular invited the opinion of certain officers as to the salaries which would secure the services of well-educated and respectable Natives, whose duties, though at first subordinate, might ultimately involve the management and direction of a Survey detachment, or even in rarer cases of a full party in the field. It was mentioned that Europeans and Eurasians received for these duties salaries ranging from ₹120 to ₹500, and that it was the object of the Government to reduce the cost of surveys.

Mr. M. Finucane, Director of Agriculture, Bengal, while admitting that he had no experience of the class it was proposed to substitute for Surveyors and Assistant Surveyors of Europeans parentage, was of opinion that Natives, with the requisite knowledge of surveying with the plane-table and theodolite, accurate arithmetic and map-drawing, might be secured on a salary of ₹60 to ₹100; but if trustworthiness was a necessary qualification, he doubted whether that quality could be secured on less pay than Sub-Deputy Collectors and Deputy Collectors received, namely, Sub-Deputy Collectors ₹100 to ₹200 and Deputy Collectors ₹250 to ₹1,000 according to grade; and he added that, in his opinion, it would be highly dangerous to put anybody of lower grade than that of a Deputy Collector in charge of a detachment or party.

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Mr. D. M. Smeaton, Director of Agriculture and Commerce, North-Western Provinces, recommended an initial salary of R60 or R80 rising to a maximum of R200 to R250.

Mr. S. S. Thorburn proposed R50 with a reasonable prospect of R300 after 18 or 20 years' service, and advised that Mahomedans should be employed as much as possible.

Mr. D. Ibbetson suggested R50 rising to a maximum of R250.

Mr. DeLa Touche considered that the salary of a Native Surveyor, who when in charge of a camp engaged on settlement work must understand the system of tenures and a great deal of Revenue law and procedure, should not commence at less than R100, and should rise to at least R300.

Mr. M. A. McConaghey, Commissioner of Sitapur, observing that well-educated and respectable Natives would be required on whom reliance could be placed to turn out good and truthful work, proposed to fix the salaries of Natives at two-thirds of those received by Europeans and Eurasians.

Colonel E. G. Wace, Second Financial Commissioner, Punjab, in advertence to the salaries paid to Tahsildars, R100 to R250; to Canal Deputy Collectors, R200 to R400; and to Extra Assistant Commissioners, R200 to R400, with occasional prospects of higher promotion, concluded that well-educated Native Surveyors of good family could be obtained at salaries rising from R80 to R300. He stated that he contemplated men who were competent to perform only the subordinate duties of the Upper Branch of the Survey, up to and including the management of a detachment. He observed that if Natives were appointed to the Upper Branch of the Survey without being required to possess a high entrance qualification and to make sustained efforts towards improvement in scientific studies, the hope of ultimately finding men fit for the charge of a full party would be doomed to disappointment.

Mr. A. Cadell proposed the following scale :—

	R		R
Surveyors, 1st Grade	350	to	400
" 2nd "	250	to	300
" 3rd "	200	to	250
" 4th "	175	to	200
Assistant Surveyors, 1st Grade	125	to	150
" " 2nd "	100	to	120
" " 3rd "	75	to	95

He observed that the salaries he had suggested for Surveyors were closer to the European scale than those for Assistants; but he presumed that these appointments would be held by quite exceptional men, and that men of such a stamp would deserve good pay, and unless they got it, would almost necessarily leave the Department. He remarked that under the prevailing system Survey officials acquired most useful Revenue experience, and that men fit for Surveyorships would probably obtain without difficulty Tahsildarships and Deputy Collectorships. Consequently, sufficient salaries were not only equitable but necessary.

Mr. J. B. Fuller doubted whether Natives of India would be found to pass the examinations involving a very extensive acquaintance with Mathematics, and accept work in the Survey Department on an initial salary of less than R100. He observed that the pay which might be fairly given subsequently would, of course, depend greatly on the work; and that if Surveyors were employed in looking after Cadastral work in the field and were placed in charge of a detachment, R200 or R250 would be fair rates of salary, for their duties would be very similar to those of Assistant Settlement officers who were receiving salaries of R200 to R300. He added that the saving in substituting Native for Eurasian or European Subordinate agency in the Survey Department would result, not so much from a reduction of salaries as from an increase in efficiency. He stated that he had not a high opinion of the Survey subordinates whom he had met as a class; that they shirked hard work in the sun and relied to a great extent on their Native Amíns and Munsarims; but he allowed that there were exceptions.

On the other hand, Lieutenant-Colonel Pitcher, Officiating Director of Agriculture and Commerce, North-Western Provinces and Oudh, was of opinion that for all subordinate posts in the Survey competent Natives could be procured for salaries ranging to R150 as a maximum, and that if the salaries were to be fixed much higher, it would be better to continue to employ European and Eurasian labour. He expressed his belief that the European's conscientiousness and absence of fear in admitting errors instead of concealing them as Natives were apt to do, constituted the peculiar value of European labour in survey work. He admitted that the Native is capable of executing mere surveying work as good as that of the European, but he considered that for the management and direction of a detachment, the European or the Eurasian are so far superior as a class in maintaining discipline and ensuring true work that it is true economy to employ them.

As the question of salaries has not yet been decided, appointments of Natives to the Junior Branch have not as yet been made under the orders of Government above mentioned; but one Hindu and one Mahomedan have been promoted from the Sub-Surveyor grade to the Junior Division as a reward for special services performed by them in connection with the Afghan Boundary Commission.

The Sub-Committee examined at Simla four witnesses—Colonel Haig, Deputy Surveyor-General of the Trigonometrical Branch; Major Sandeman, Deputy Superintendent of Survey;

Lieutenant-Colonel Coddington, Deputy Superintendent of Survey, and Mr. J. S. Pemberton, Surveyor, 2nd Grade, Junior Division.

Colonel C. T. Haig stated that it is essential that the present proportion of Military officers in the Upper Division of the service should be maintained, both on account of the demands made for Military requirements, and also for the conduct of operations across the frontier with Military expeditions. He stated that fourteen Military officers of the Department were serving in Afghanistan during the late war, and that difficulties arose from the circumstance that, occasionally, officers required for Military service were pronounced unfit for such employment. He also stated that five Military officers had been deputed on special duty of a political nature, one being attached to the Gilgit Mission, three to the Afghan Boundary Commission, and one to the Thibet Mission. Of the three gentlemen specially appointed to the Department, he informed the Committee that two had been selected for their Mathematical attainments, one of them being a Senior Wrangler and the other a Senior Optime, and that the third was brought into the Madras Survey Office by reason of his attainments in Chemistry and scientific knowledge of Photography. He considered that the nine men promoted from the Junior Division are efficient Assistant Superintendents, but that in general education they are inferior to the Military officers, although four had been selected from the inferior grades in the Junior list on account of their being specially well educated. He also considered them inferior as regards their professional qualifications to the Military officers, inasmuch as their education has been more confined to details and restricted to the work on which they had been employed. He stated that the work of the Sub-Surveyors is very well done indeed; that as a rule they are obtained from the lower class of Natives, and that he had only had one Native under him in that grade who had been educated; that he had recommended this man for promotion to the Junior Division, but that the man had been obliged to retire owing to ill-health. He also stated that he had never met a Native who he thought would be fit for the superior executive appointments; that a great deal of confidence is reposed in Executive officers both as regards the expenditure of money and the dispensing of patronage, and that he should be inclined to be doubtful of Native agency entrusted with so large a discretion. Looking at the work from a professional point of view, he thought that Natives would perform the duties of Executive officers efficiently so long as they received very definite orders, but that they would fail in independent charges. For accuracy of work he considered the Native quite as competent as the European Surveyor; but that in the absence of supervision the European would be more trustworthy in his work than the Native. He also stated that he considered the educated Native would think it beneath him to do a great deal of the range work which has to be done by officers in the junior grades of the service. He expressed himself as opposed to selection by competitive examination, and preferred a qualifying examination and selection for admission to the Department.

Major J. E. Sandeman described at length the duties of an officer in charge of a Cadastral survey, and the difficulties encountered by him in securing the preparation of an accurate record of rights. He stated that the presence of a superior European officer is necessary to encourage tenants to assert their rights and to check the corruption which prevails when rights are being recorded. He mentioned that the Junior Division of the Survey is chiefly recruited from pupils of the hill schools, and that in his experience they are an efficient body of men fairly educated, hardworking and well-conducted, but that many have lost heart owing to the slowness of promotion. He also mentioned that he had known one Native Assistant Surveyor, now dead, who had been promoted from the Sub-Surveyor grade; that he was well-behaved and a good Surveyor and Draftsman, but that he could not have taken the place of the Europeans he (Major Sandeman) had had under him. He declared that he had never yet met a Native who would appreciate the necessity for or exercise the constant vigilance over the work which Europeans exercised; but if they could be found with the same strict integrity and the same powers of control and resource as Europeans, he thought that they ought to have an equal chance of all appointments, high and low, in the Department; and he was of opinion that Natives ought, at any rate, to be tried in the Junior Division of the Department in a certain proportion; but that those who were so tried should possess the same educational qualifications as the Europeans. As to the method of appointment he considered that competition might be allowed if it were protected by two or three years' probation, and that Natives and Europeans might compete together, provided that care was taken not to admit too many Natives.

Lieutenant-Colonel F. Coddington maintained that the Military element must always prevail largely over the Civilian in the Senior Division. He considered that of the Assistants who had served under him, the Europeans educated in England had exhibited more energy and a higher moral tone than those educated in India, and that both were for survey work decidedly preferable to Eurasians. He added that of the Europeans many who had served under him had been educated at the hill schools, and had done well in the Department, and that he also had had men from the Royal Engineers who had passed through the Rurki course and were very good men; that of late a larger number of Europeans who had received their education in England had applied for employment; that these candidates are the sons of shopkeepers and other persons whose parents have been in business in India, and who have come out after completing their education to seek employment in India. As to the Native Sub-Surveyors, he considered that so long as they could be employed in a groove or given a fixed rule to go by, they perform excellent work, provided they know that their work will be checked and examined.

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He stated that he had no objection to the employment of Natives with the necessary professional acquirements and an equally strong moral tone to that of the European in the lower Division of the Service. In his experience the only Natives with whom he had had to deal were not, as a class, trustworthy, and he had found that his best Native Surveyor, who is a very good man, at once got into difficulties when he was sent by him to work independently and without supervision.

Mr. J. S. Pemberton, a domiciled European educated at the Doveton College, Calcutta, entered the Department at the age of 17 as a Sub-Assistant Surveyor on R100 and rose to his present grade. He informed the Committee that the Natives who entered the lowest Division are of the middle class of Native society and sufficiently intelligent and educated for the duties committed to them; that they had received their education in Zillah schools; and that many had passed the Middle School examination and possess some slight knowledge of English. In regard to the comparative capacity of Hindus and Mahomedans for rendering efficient service in the Survey, he considered the Hindus superior as Computers and Accountants and the Mahomedans as Surveyors, Explorers and Draftsmen; while he regarded the European or Eurasian as superior to the pure Asiatic in his capacity for doing what was required of him. He regarded Europeans educated in India as not less capable than Europeans educated in England. As a means of recruitment he expressed his preference for selection after a qualifying examination to a competitive examination, because a competitive examination cannot test moral qualities. He complained that the rules respecting the counting of furlough for pension are unfair, as they do not apply to all the public services; and he advocated the application to the Department of a system of graded pensions.

Sir Edward Buck has favored the Committee with a note on the evidence taken at Simla. He observes that the Department of Revenue and Agriculture has met with some opposition in its attempts to introduce Natives into anything like well-paid appointments in the Survey Department, and he attributes this failure to the opinion that however efficient Natives may be in the mechanical work—as is admitted by the evidence—they are not qualified for responsible posts entailing the duties of organization and inspection. His experience confirmed by the evidence is that no sufficient attempt has been made to employ Natives of a class fitted to supervise and to give them the necessary training, and that, on the other hand, Europeans of a decent position and more or less educated—men who are likely to be good Overseers or to be qualified to take charge of a party—are appointed at once to a grade which carries with it more or less responsible duties, and are allowed a certain time to learn their work. He states that with one exception the Natives who have been admitted to the Junior Branch have been men who were wanting in education and of a class who are accustomed to obey and not to command, and of whom, consequently, it is not to be expected that in their old age they will turn out good Supervisors.

Sir Edward Buck considers that it would be unfair to impute this result altogether to the officers in charge of the Department. He admits that they do not know where to find the men they require, and that in training a European they have some assurance that he will possess certain characteristic qualities on which they can depend, *viz.*, more or less energy and perseverance, pride in good work, &c.,—qualities which, in his judgment, are not met with in a Native with certainty.

He attributes the difficulty of finding qualified Natives rather to the want of a training field, so that a selection might be made from men whose qualities have been already tested by actual work. Adverting to the training for Tahsildarships recommended by him in his evidence given before the Commission, he advises that Native Survey officers should also be drawn from the corps of Revenue Inspectors and Kanungos. He points out that these officials as Overseers of Patwaris are from the first accustomed to supervise and command and are required to possess an elementary knowledge of surveying; and that if effect is given to his suggestions they will be men of decent family and good education. He asserts that if a few of the best men of this class, after having had a trial of a year or two in the corps of Kanungos, are selected for the Junior Branch of the Survey Department, it is probable that they will turn out good Supervisors. He insists that the failure in all branches of the administration to find efficient Natives to fill responsible offices is due to the fact that the choice has lain "between, on the one hand, men who have risen from the ranks who never entirely lose traces of their servile habits, and who consequently are more or less unfitted to command, and, on the other hand, men who, although of good family and education, are untried in the field and generally fail, either because they are really incapable, or because they have had no training." He maintains that the necessity for a training field for educated Natives from which to select the fittest is apparent from the examination of every Department. He mentions that even the Native students educated at Cirencester could find no employment on their return to Bengal until he had personally arranged that for a season they should be trained in the Settlement Department of the Central Provinces, and that these men are now doing valuable work in the Settlement Department in Bengal. He considers it unfair to expect Native graduates to be efficient employés unless a training field is provided for them: and for the Survey Department he can suggest no better field than employment among the 4,000 or 5,000 Revenue Inspectors and Kanungos who are maintained throughout India. He desires not to be understood as suggesting that Natives are competent to do all the work of the Survey that is done by Europeans. He considers that the charge

of a large Survey calls for superior control of a high order for which the talents and training of the best educated European Survey officers are needed.

In support of this opinion he refers to the experience acquired in Bengal where for some years the field surveys were locally organised and the services had been secured of some Natives who showed much ability, yet in 1884, after prolonged inquiry, the Government was compelled to admit that the assistance of the professional Survey Department was necessary and the framework of the survey and the organisation of the operations are conducted by the officers of the Department, while the details are filled in, and completed by, local Native officials trained under professional supervision.

Mr. P. N. Bose, Deputy Superintendent of the Geological Survey, contended that there is no valid reason for the exclusion of Natives at least from the Junior Branch of the Department. He asserted that the objection on account of want of physique is unfounded inasmuch as Native officers in the Public Works Department have to work at least as hard as the Survey officers and in all kinds of weather throughout the year, whereas the Survey officers work in the field only for six or seven months. He contended that inasmuch as the salaries are sufficient to secure the services of men of average education and of the same class as recruited the Subordinate Judicial and Executive Services, the objection on the score of moral unfitness is equally baseless. He proposed that the Junior Branch should be recruited by open competition, and that a certain number of appointments in the Senior Branch being reserved for Military officers, the rest should be filled by a competitive examination of such a nature as to procure men of sufficiently high mathematical and scientific attainments or by selection from graduates of the Universities. He urged that the employment of civilians on the two-thirds scale of pay would effect a considerable saving. Admitting that Military men are required for the direction of Survey parties to accompany Military expeditions or to work in disturbed tracts, he considered that Revenue Surveys and Topographical Surveys in peaceful parts of the country might be entrusted to Civil officers.

Mr. Kanti Kanta Sen, Head Master of the Training School at Dehra Dun, forwarded a note in which he complained of the exclusion of Natives from the graded service. He asserted that at the examination mentioned in the correspondence above referred to, Natives were not allowed the same opportunity of improving themselves in drawing during a period of probation as had been afforded to Europeans, and that the announcement respecting their entertainment on less pay than is enjoyed by Europeans had deterred other Native candidates from presenting themselves. He quoted an extract from a report by General Walker to prove the efficiency of Natives as computers, and an extract from a report by Colonel DePrée to prove that Natives are at least equal to Europeans in surveying. He also complained that the removal of the Survey office to Mussoorie entailed expense and inconvenience on the Native establishment.

Mr. Parbati Churn Roy, B.A., Deputy Collector and Subordinate Judge at Darjiling, who was for some years engaged in a Dearah Survey and Settlement in Bengal, also forwarded a note in which he combated the grounds on which Natives are pronounced unsuited for employment in the graded service in this Department. Contrasting the subjects prescribed for the examination of candidates for admission to the Junior Division with the subjects prescribed for the first examination in Engineering at the several Indian Engineering Colleges, he maintained that the chance of obtaining a recruit for the Junior Division, who would be qualified for promotion to the Senior Division, would be far greater if appointments were made of students who have passed the first examination in Engineering than they are when the selection is made of candidates who have passed the examination prescribed by the rules of the Department. But he asserted that the initial salary of R120 is sufficient to attract students who have passed even more severe examinations and have qualified as licentiates in Civil Engineering or have taken the B. C. E. degree with honors. He contended that so far as regards the required scientific education, Natives may be found with adequate qualifications. He referred to the testimony borne to the merits of Babu Radha Nath Shekdar, Babu Kali Mohun Ghose, by Colonel Everest and General Walker, as disproving any suggestion that Natives are unfit for employment in the Survey owing to intellectual inferiority.

As to the objection that Natives are deficient in physique and therefore unable to undergo the exposure and severe labour entailed on officers of the Survey, he argued that the greatest amount of physical endurance is required of the Sub-Surveyors who are principally Natives and whose work is, during six or seven months in a year, carried on mainly in the field, and not of the European Surveyor or Assistant Surveyor of whose work much is performed under canvas. He added that if the objection on the score of physique is confined to educated Natives, it is disproved by the fact that in other Departments educated Natives have shown themselves posssessed of sufficient endurance for arduous labour out of doors. He instanced the Native Engineers employed as Sub-Engineers, Supervisors, and Overseers in the Public Works Department, and he pointed out that in the Survey Department itself Babu Surat Chunder Dass, C. I. E., the Thibetan explorer, had proved his capacity for continuous physical endurance and had sustained privations of the severest nature. He maintained that no opinion could be pronounced as to the unfitness of educated Natives for employment in the higher appointments in the Survey Department until they have been allowed a fair trial, and that the production of the certificate of the Medical officer is a sufficient guarantee against the appointment of persons who are wanting in physique. He mentioned that in conducting the Dearah Survey all his Assistants had been selected from students of the Engineering College, and that although they had been severely tried when engaged on the survey of the islands at the mouth of Megna, they had stood the test without any failure. He argued that, *primâ*

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facie, Natives must be more able than Europeans to endure the vicissitudes of an Indian climate to which their race has been so long exposed and to which it has adapted itself. He alluded to the confidence reposed in the Native Judiciary as negativing the suggestion of the untrustworthiness of Natives as a disqualification for survey work, and in proof that Natives could be found who are not wanting in fertility of resource, aptitude for organization and power of enforcing orders, he adverted to the duties which devolve ordinarily on Native Magistrates and Native Engineers; and he called special attention to the circumstance that Sir Richard Temple, in noticing the services of officers during the famine of 1874, had commended Native gentlemen equally with distinguished members of the Civil Service for having displayed " a meritorious zeal, intelligence and practical aptitude " in the discharge of their duties as relief officers; that he had classed Native Executive Engineers with European officers as worthy of commendation for " having laboured with energy and success to provide relief work and to turn relief labour to the best advantage; " and that in reference to Native as well as European subordinates of the Public Works Department he declared that they had " distinguished themselves by hard work under difficulties of climate and circumstances." The large rivers in Bengal vary in their course from year to year to such extent that at times many square miles of land are submerged and again reformed. In 1847 an Act was passed providing for a decennial survey of the lands on the banks of these rivers. The boundary pillars erected by the Survey Party were destroyed by the action of the river, and when land was reformed on an ancient site disputes constantly arose respecting its ownership. In 1872-73 the Bengal Government took in hand the resettlement of the alluvial lands (*Dearah*) in the Ganges valley from Kooshtea to Shahbazpore. The preliminary operations were conducted by the Revenue authorities who laid down boundary marks at the tri-junction points of villages about three miles distant from the existing channel and on each side of it so as to form a basis for the operations of the Professional Survey. In 1873-74 a party detailed from the Survey Department was charged with the survey of the alluvial lands. It was the intention of the Bengal Government that the survey should be rendered of permanent value by extending it inland sufficiently to give it a base beyond the range of fluvial action, and from this base to retrace the boundaries of villages between the base line and the river as they were delineated in the maps of the previous survey, in order that the Settlement Officer might ascertain which village had gained and which had lost land by the action of the river. The Settlement Officers complained that the operations of the Survey Department did not meet their requirements, and in 1878 Mr. Parbati Churn Roy was entrusted with the combined duties of Survey and Settlement, and in that and in subsequent years conducted the Dearah Survey of the lower course of the Ganges, Brahmaputra, Megna, Dhalesari and Jamuna. These operations having been referred to in proof of the competency of Natives to superintend Survey operations, Mr. Parbati Churn Roy who had expressed his wish to give evidence in the inquiry into the Department, but could not conveniently attend for oral examination, was invited to communicate his views in writing, and, in reference to a suggestion which appeared in the evidence, to state to what extent, in carrying out the Dearah Survey, he had availed himself of the previous work of the Trigonometrical Survey.

Mr. Parbati Churn's reply will be found in the note* to which reference has been already made. He has described the operations which he was called on to undertake and has referred to passages in successive reports of the Bengal Government which approved of the manner in which the work was being carried out and of the economy effected by the substitution of the Revenue for Departmental agency, and to reports of Lieutenant-Colonel MacDonald and Colonel Vanrenen, Superintendents of Revenue Surveys, which admitted the difficult nature of the duty committed to him. He further explained to what extent he availed himself of the results previously obtained by the Survey Department.

In concluding his note, Mr. Parbati Churn Roy dwelt on the difficulty experienced by the several Governments in ascertaining the qualifications of Native candidates for employment, and suggested the institution of a Board similar to that of the Civil Service Commission in England. He maintained that the result of his experience in various offices was that there are educated Natives competent to hold any appointment under Government, though he admitted that the number of such Natives is at present very limited.

In reference to the Dearah Survey, Sir Edward Buck considers that Mr. Parbati Churn Roy's statements require modification. He observes that the work conducted by him was executed after a framework of boundary points had been fixed by the Topographical Survey; that General Walker, then Surveyor-General of India, showed that that work was only a portion of the work performed by the Survey Department; that it was not executed at lower rates than the rates at which such work is ordinarily executed by the Department, and that being founded on the traverses of the Survey it was not of an original or scientific character. Sir Edward Buck states that the merits of Survey work conducted under Native superintendence were very fully discussed by the Bengal authorities in anticipation of the survey of Behar in 1884; that the opinions of many officers including Mr. Parbati Churn Roy were obtained, and that the Bengal Government eventually decided, in complete concurrence with the views of the Government of India, that the survey must be conducted under professional supervision. He considers that from the nature of the Dearah Survey it affords no proof of the competency of Natives to undertake the more scientific work of the Survey, and he maintains that a Native, however able, would not be more competent than a European to take charge of a Revenue Survey party without adequate training.

* Page 38, Part I, Vol. relating to the Survey of India.

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Section II.—Note by the Departmental Member.

READ—the following letter from Lieut.-Colonel H. R. THUILLIER, R.E., Surveyor-General of India, to the President, Sub-Committee, Public Service Commission, dated Simla, 9th July 1887, No. 317S-S.

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In reply to your letter, No. 387-S, dated the 6th instant, I have the honor to state that there are at present only two Sub-Surveyors * of this Department whose salaries range from Rs. 100 to Rs. 110. Both these men were originally appointed on small salaries and have risen to their present salaries through merit and length of service.

* Asiatics (Hindus.)

2. There are no grades in the Sub-Surveyor class. The men are generally first taken in as apprentices on pay of Rs. 10 to 15 per mensem, and their salaries are increased from time to time according to their qualifications and services up to the limit of Rs. 110 per mensem. Sub-Surveyors are subject to the Financial Codes as regards pay, leave and pensions.

READ—the following letter from Lieut.-Colonel H. R. THUILLIER, R.E., Surveyor-General of India, to the President, Sub-Committee, Public Service Commission, dated Simla, 12th July 1887.

Regarding the discrepancy in the number of Eurasians in the Senior Branch as given in my statement and in Colonel Haig's evidence, the reason is due to the want of definition of what constitutes an Eurasian. As far as I can learn this has never been laid down, and in some cases it is very difficult to draw the line between an European domiciled in India (born and educated in India) and an Eurasian; and all we have to go upon is what these gentlemen call themselves. In the case in point my statement is correct according to official returns, though I have little doubt that two out of the six entered under the head of "Europeans domiciled in India" are really Eurasians. They all like to be considered Europeans.

I am not aware of any special report that was written by General Walker on Native Sub-Surveyors. The report referred to in the Secretary of State's Despatch, No. 34, dated 10th July 1879, is General Walker's report of the operations of the Department during 1877-78, but I can find nothing special regarding Natives. I send herewith a copy, and have marked certain passages—page 6 *et seq.*—referring to the utilization of Native agency. The only reports on the work actually done by Natives will be found in the foot-notes, *e.g.*, page 20. The Survey Department has always recognized the good services of this class of men who are employed in subordinate positions. Will you kindly return the report when done with as it is the only copy I have here.

I enclose a copy of Colonel DePrée's Departmental Order No. 11 which you ask for. Please observe that the memorandum merely embodies Colonel DePrée's own experiences and his own method of procedure, which I may say, as regards the opinions expressed in paragraphs 4 and 5, have not my accord, and I can safely say that the practices of the Department is at variance with them.

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Colonel DePrée has gone, and I am unable therefore to say anything further on his views. But to disprove the inference that has been made that Natives are not permitted to touch a theodolite, I may inform you that there are five Survey parties employed in the Central Provinces in which the Native Sub-Surveyors work exclusively with the theodolite, and in nearly all the parties a certain proportion are employed on theodolite work.

Note on the Survey of India Department.

I. Rules and Regulations—Organization.—The professional branch of the Survey of India Department is organized as follows :—

(a) Administrative Staff.

		Per Mensem. RS.
1	Surveyor-General	3,000
1	Deputy Surveyor-General, Revenue	2,200
1	Do. Trignometrical	2,000
3	Total.	

(b) Senior Division.

Deputy Superintendents.

3	Posts, 1st grade, on	1,600
8	„ 2nd „ on	1,300
10	„ 3rd „ on	1,000
11	„ 4th „ on	850

Assistant Superintendents.

11	Posts, 1st grade, on	600
6	„ 2nd „ on	500
	(Civilian Probationers)	400
49	Total.	

The officers of the above Division are composed of Military and Civil, the proportion not being fixed, but left to the Surveyor-General subject to the control of Government. The average proportion for the last 15 years has been 3 2 Military officers to 1 Civilian.

(c) Junior Division.

Surveyors.

		Per Mensem. RS.
8	Posts, 1st grade, on	500
10	„ 2nd „ on	400
14	„ 3rd „ on	350
18	„ 4th „ on	300

Assistant Surveyors.

41	Posts, 1st grade, on	200 — 10 — 250
22	„ 2nd „ on	160 — 8 — 210
22	„ 3rd „ on	120 — 8 — 160
135	Total.	

(d) Sub-Surveyors.

There is a large staff of Sub-Surveyors composed almost exclusively of Natives of India (Asiatics). In this section of the Survey of India Department there are nearly 500 posts on salaries ranging from Rs. 10 to Rs. 110 per mensem.

2. *Regulations.*—The regulations of the Department as to admission to its various grades and ranks and promotions therein are embodied in Annexures A, B and C.

3. *Admission (Senior Division).*—Candidates are admitted into the Senior Division by the Government of India on the recommendation of the Surveyor-General. Royal Engineer officers are appointed substantively without examination. Staff Corps officers are appointed as probationers for one year (this period may be extended to two years), and are confirmed subject to their passing examination laid down in the Bengal Army Regulations, *vide* Annexure A.

Civilians are selected from the Junior Division for appointment to the Senior Division, subject to the approval of the Government of India and are eligible for promotion thereto without any examination. The Civil element in the Department is almost entirely composed of such officers.

Civilians possessing special qualifications are appointed without examination, when a specialist is required for any particular post, either by the Secretary of State or by the Government of India with the sanction of the former; other Civil candidates may also be appointed on passing the examination prescribed in Annexure B. These officers are, as a rule, probationers and receive Rs. 400 per mensem until confirmed, usually within one year, and then they draw Rs. 500.

Appointments to the Junior Division are made by the Surveyor-General after duly approved candidates have passed a satisfactory examination, *vide* Annexure C. The officers in this Division consist almost entirely of Europeans domiciled in India and Eurasians, but under recent orders of Government, Natives of India (Asiatics) are to be admitted; the conditions of service however, under which they are to be admitted, are still under consideration of Government. Recently two appointments under the existing conditions have been made of Natives from the Sub-Surveyor class, as a reward, however, for special services in connection with the Afghan Boundary Commission.

4. *Promotions.*—Promotions in the Senior Division are, as a rule, made by seniority unless an officer is considered incompetent. Promotions in the Junior Division are also made by seniority, but under certain conditions of qualifications laid down and approved by Government.

5. *II. Conditions of Service.*—As regards the conditions of service in regard to pay, pension and furlough, it may be generally stated that these are governed by the ordinary rules of the Military and Civil services, as embodied in the Army Regulations and in the Civil Pension, Leave and Pay Codes.

6. *Pay.*—The pay of all posts is consolidated and the amounts are given under the head of organization, *vide* paragraph 1.

Royal Engineer Officers, excepting those on the Administrative staff and in the 1st grade of Deputy Superintendents, receive their net Military pay according to the following scales in addition to the substantive pay of the post already detailed :—

	RS.	A.	P.
Colonel	304	6	0
Lieutenant-Colonel	243	8	0
Major	182	10	0
Captain...	140	0	0
Lieutenant	70	0	0

7. *Pensions (Military Officers).*—The pensions of Military officers are governed by Military rules.

* *Full scale pension.*

	RS.
Average emoluments over Rs. 12,000 per annum ..	5,000
Do. do. over Rs. 8,000 to 12,000 per annum.	4,000
Below Rs. 8,000 per annum	half average emoluments.

Civilians.—The pensions of Civilians are governed by the ordinary rules of the Civil Pension Code* which apply to all Civil Departments.

8. *Pensionary Service.*—Civilians of the Senior Division under existing orders cannot count as service towards pension any part of their furlough obtained under section 96 of the Civil Pension Code, as in the case of the officers of the Geological Survey and of the Public Works Department and Forest Department who are appointed by the Secretary of State. Two Civil officers have lately been appointed by, or with the special sanction of, the Secretary of State and with the exception of these, whose cases are now before the Government, all Civilian officers both of the Senior and Junior Divisions come under the ordinary rules for Uncovenanted officers generally, all furlough being deducted from their pensionary service. The pensionary services of Military officers are governed by the Furlough Regulations of 1868 and 1875.

9. *Furlough.*—Military officers, excepting Royal Engineer officers, who have elected for continuous Indian service and who are therefore under Civil rules, obtain furlough under Military rules.† Civilian officers, if appointed by the Secretary of State or with his special permission, as well as those Civilian officers whose names are in

† Furlough rules of 1868 and 1875.

schedule B of the Civil Leave Code, are entitled to a total furlough of six years, all others being entitled either to two years' furlough or to six months' leave on private affairs every six years of their service, in lieu of furlough.

The connection with the Department of every officer of the Senior and Junior Divisions ceases on attaining his 55th year.

10. *III. Technical and Professional requirements.*—The technical and professional requirements for admission to the Survey Department in the Senior Division are detailed in Annexures A and B, those for the Junior Division in Annexure C. In the former division the Military officers, especially those of the Royal Engineers, receive a high scientific education and training which are eminently calculated to produce the requisite qualifications for a Survey career, viz., a mind well instructed in the exact sciences and an energetic self-reliant character. These qualities which serve a young English Military officer so well in the early years of his Survey career may be expected to develope into talents of organization and control when required to supervise large establishments. The Civil officers are almost entirely recruited from the Junior Division and are selected from those who have proved themselves to be thoroughly qualified for the charge of a Survey Department. The few exceptions are when experts are required and these are obtained for a special object in view. The attainments for efficient service in all branches of the Department must be varied. The purely scientific work, viz., geodetic, tidal researches, gravity variation, &c., requires the exercise of high mathematical ability, the knowledge of the construction of the instruments employed and a practical familiarity with their management. Topographical and geographical work need artistic and scientific skill, physical endurance and perseverance, while cadastral surveys entail the supervision of very large establishments and include much of the work formerly performed by the Settlement Department, viz., the preparation of the record of rights which involves a knowledge of Revenue laws.

11. For the Junior or Subordinate Division in addition to the professional attainments requisite, moral and physical qualifications are also highly essential, viz., fertility of resource, trustworthiness, aptitude for organizing, power of enforcing orders, endurance and activity.

12. *IV. Classes who seek employment.*—For the Senior Division, Military officers are the principal candidates. Out of 49 officers composing that Division, 37 are Military officers (of whom 18 belong to the Royal Engineers) and 12 are Civilians of whom 9 have been promoted from the Junior Division and 3 have been appointed for special qualifications to fill certain technical posts. The Department is therefore mainly Military in its Executive staff, which is the case in the Survey Departments of all the leading nations in Europe, and this in itself is good evidence that the Military class is the best fitted for the duties demanded of it. For co-operation with Military Forces and for Political Missions it has been found essential to place Survey parties in the field under Military Executive officers, and the calls for Military Survey officers during recent years have proved how difficult it is even with the present strength of the Military staff to meet the requirements when Military operations on any extensive scale are being carried on across the frontier. The present proportion of the Military element should, therefore, on no account be reduced. The duties of the Survey Department are many and varied. Some of the officers must necessarily be kept for special duties, the remaining officers ought to be so selected that they may be capable of undertaking any work that the Department may be called upon to perform, and the quality of general usefulness is far more likely to be found among Military and Civil European officers than among Natives. The existing proportion of the Civil element I would maintain to afford the means of rewarding meritorious officers of the Junior Division and to provide for specialists when required. I consider that the appointments in the Senior Division should be restricted to officers of European birth and education, and I further venture to say that Natives who have received the required scientific education and possess the qualifications necessary for these appointments are not yet to be found.

13. With regard to the Junior or Subordinate Division, the candidates hitherto have been for the most part Europeans domiciled in India and Eurasians, who have been educated in India and many of whom have passed the lower or higher matriculations of the Indian Universities. The experiment of employing Natives in this branch was tried in past years to a limited extent, but with so little success that it was not continued. The Government of India have, however, after much correspondence on the subject, lately directed that Natives of India are to be admitted to the Junior Division and it therefore appears unnecessary to reopen the question of the comparative capacity of the European or Eurasian and of the Native for rendering efficient service in this branch. Appointments of Natives under these orders have not yet been made as the question as to the salaries that are to be given has not yet been decided.

In the lowest division, that of Sub-Surveyors, the services of Natives have been extensively utilized in practical Survey work in the field under European supervision, and the work that has been and is being performed by this class of men under that condition is all that could be wished.

V. Organization.—The existing organization and constitution of the Department is attached in the form prescribed.

Existing organization and constitution of the Survey Department.

1	2	3	4						
			NUMBER OF APPOINTMENTS IN EACH CLASS OR GRADE NOW HELD BY—						
Department.	Total number of gazetted appointments, or of appointments not being purely clerical, of salaries of Rs. 100 and upwards.	Distribution of the gazetted appointments and of other appointments mentioned in column 2 amongst classes and grades, with rates of pay attached to each.	1 Europeans not domiciled in India.	2 Europeans domiciled in India.	3 Eurasians.	4 Natives of India. (a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
Survey of India.	Gazetted.	*Administrative Staff.*							
	1	Surveyor-General, Rs. 3,000.	1	..	..	..	..	..	..
	1	Deputy Surveyor-General, Rs. 2,200.	1	..	..	..	..	..	..
	1	Deputy Surveyor-General, Rs. 2,000.	1	..	..	..	..	..	..
		Senior Division.							
	3	Deputy Superintendents, 1st grade, Rs. 1,600.	3	..	..	..	..	..	..
	8	Deputy Superintendents, 2nd grade, Rs. 1,300.	8	..	..	..	..	..	..
	10	Deputy Superintendents, 3rd grade, Rs. 1,000.	9	1	..	..	..	..	..
	11	Deputy Superintendents, 4th grade, Rs. 850.	10	1	..	..	..	..	..
	11	Assistant Superintendents, 1st grade, Rs. 600.	7	3	1	..	..	..	..
	6*	Assistant Superintendents, 2nd grade, Rs. 500.	2	1	..	..	..	..	..
Total ..	52								
	Non-gazetted.	*Junior Division.*							
	8	Surveyors, 1st grade, Rs. 500.	..	4	4	..	..	..	..
	10	Surveyors, 2nd grade, Rs. 400.	2	7	1	..	..	..	..
	14	Surveyors, 3rd grade, Rs. 350.	1	12	1	..	..	..	..
	18	Surveyors, 4th grade, Rs. 300.	2	12	4	..	..	..	..
	41	Assistant Surveyors, 1st grade, Rs. 200-10-250.	..	29	12	..	..	..	..
	22	Assistant Surveyors, 2nd grade, Rs. 160-8-200.	..	17	5	..	..	..	..
	22 †	Assistant Surveyors, 3rd grade, Rs. 120-8-160.	..	12	6	1	1	..	2
		Sub-Surveyors.							
	..	Sub-Surveyors, Rs. 100-110.	..	..	..	2	..	..	2
Total ..	137	Total ..	47	99	34	3	1	..	4
Grand Total ..	189								

* 3 posts vacant. † 2 posts vacant.

A.

EXTRACT FROM REGULATIONS AND ORDERS FOR THE ARMY OF THE BENGAL PRESIDENCY.

Appointments in the Survey Department under the Government of India.

Period of probation.

140. For this Department the period of probation will be one year (paragraph 6, section 4). If in any case strong special reasons render an extension of this term expedient, application should be made, through the Surveyor-General, in full time to permit of orders being passed before the period of probation expires.

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Officers of the Royal Engineers, however, can be appointed as 2nd-grade Assistant Superintendents without any Departmental examination, and rank above all Probationary Assistants, whether Military or Civil.

Certificates and mode of application.

141. Every candidate will be required to furnish a certificate from his Commanding officer (paragraph 7, section 4), and from a Surgeon a certificate of the following form :—

"I certify that, to the best of my belief———is in good bodily health, has good eyesight, and is apparently well capable of undergoing the vicissitudes of service in India."

The candidate will submit this certificate, with application for employment, through the Adjutant-General, Simla, together with a statement of his qualifications, to enable the Surveyor-General to form an opinion as to his present or probable future fitness for the Department. No British officer (not being a Royal Engineer officer) can obtain probationary employment in the Survey Department until he has entered the Staff Corps.

Preliminary Examination.

142. The preliminary examination will embrace the following subject :—

I.—Arithmetic, including involution and evolution ; arithmetical and geometrical progression ; proportion or rule-of-three ; vulgar and decimal fractions ; logarithmic calculations ; and mensuration of surfaces.

II.—Elementary geometry ; first four books of Euclid.

III.—Algebra as far as quadratic equations, inclusive.

IV.—Elements of plain trigonometry.

V.—Topographical, mechanical, or civil drawing, to be executed in presence of examiners.

Exemptions from preliminary examination.

143. Officers holding certificates of qualifications, granted at the institutions of Sandhurst and Woolwich, or the Staff College or Civil Engineering Colleges, or who may have passed an examination in surveying according to the army standard, will be exempted from undergoing any preliminary examination, and will, on being nominated, at once enter as Departmental Probationers and be attached to Survey parties to learn their practical duties in the field and during the recess.

Final examination.

144. The final examination to be held at the close of the period of probation will comprise—

I.—The satisfactory execution, unassisted, of a small area of country, including the computation and entire mapping involved in the same.

II.—Perfect use and knowledge of all the instruments employed in the Department, and adjustment of the same.

III. Familiarity with the details of the several calculations for the reduction of the observations which are commonly used in the Survey Department.

IV.—The elements of practical astronomy, sufficient for ascertaining time, azimuth, latitude and longitude.

V.—A fair knowledge of all rules in force for the general conduct of the Survey Establishments.

Local lingual test.

145. Each candidate will also be required to produce a certificate of having passed the Higher Standard examination in any vernacular language prescribed by the Government of India.

Conduct of examination.

146. The examination will be conducted by the Surveyor-General, aided by such professional officers, to the number of two, as may be available. Whenever desirable, sealed examination questions may be transmitted, in view to their being answered by the Probationer in the presence of the officer in charge of the Survey party to which he is attached, in lieu of obliging him to appear at Departmental head-quarters for the purpose of examination.

Degree of efficiency, how ascertained.

147. The degree of proficiency attained by candidates will be ascertained by written questions, the examination-papers being framed at Departmental head-quarters.

Consolidated Pay of the Grades of the Survey of India Department.

| | | |

B.

RULES FOR ADMISSION OF CIVILIANS TO THE SENIOR ESTABLISHMENT OF S. I. D.

Promotion of Surveyors to Senior Establishment.

11. Surveyors of the 1st grade on Rs. 500, who have proved themselves to be in every way qualified for the charge of a Survey party, and in special cases Surveyors of the other grades possessing similar qualifications, will be considered eligible, subject to the approval of the Government of India, for appointment to vacancies in the Senior Establishment, as Assistant Superintendents of the 2nd grade, without any examination.

Should they be in receipt of a higher salary than that of an Assistant Superintendent, 2nd grade, they will draw the difference as a personal allowance until they are promoted to the 1st grade of Assistant Superintendents.

Senior Establishment.
Admission of candidates not in the Junior Establishment.

12. For admission on probation to the Senior Establishment of Civil candidates not in the Junior Establishment, and for confirmation as Assistant Superintendent, the following are the rules :—

Rules for admission on probation to the Senior Department of either of the three Branches of the Survey of India, as sanctioned by the Government of India in Home Department letter, No. 233, *dated the* 28*th February* 1868.

Rule I.—A candidate, who is not serving in the Junior Department, must furnish proper medical certificates of bodily health, strength, activity, and good eyesight; and that he is in these respects fit to perform the duties required in the Survey Department.

He must also furnish proofs that he is not less then 18 years of age, or more than 25 years of age.

He must also produce testimonials of good moral character from persons qualified by previous knowledge of the candidate to give the same.

In case of a candidate who has previously served or is serving in the Lower Department of the Survey, it will be sufficient that he submit a certificate from his immediate superior under whom he has last served, to the effect that he is fitted, as respects age, character, and physical qualifications, for the Senior Department of the Survey.

Rule II.—A candidate will be required to supply satisfactory proof of having graduated at some recognized University or Civil Engineering College, in default of which he will be required to pass the examination laid down in G.O.P.C. No. 244, dated 19th April 1851 (copy following).

Every candidate, before admission on probation, will be required to have a fair colloquial knowledge of the Hindustani language, to be tested by examination, and will b efurther required to pass a professional examination by the Lower Standard laid down by the Survey Department in G.O.G.G. No. 531, dated 27th June 1864 (extract following).

Rule III.—The candidate must be able to write and print very clearly and well, and must possess a fair skill as a topographical and military draftsman. A knowledge of ground or hill-sketching and shading will be specially required.

Rules for confirmation as Assistant Superintendents (Civil) in the Senior Department of the Survey.

Rule I.—A candidate appointed on probation, must serve for one year before becoming eligible for confirmation in the Survey Department.

Rule II.—The candidate must produce certificates from his official superiors of having, during his period of probation, exhibited intelligence, good temper and discretion in his intercourse both with his superiors and with his subordinates specially his Native subordinates, and with the Natives of the part of the country in which he has been employed; that he has also shown capacity to command his subordinates, personal energy and fertility of resource, and capability of overcoming difficulties where such have occurred; certificates also from his late superiors of continued good moral character, health, and physical strength.

Rule III.—The candidate must further produce certificates, from the immediate official superiors under whom he has served during his period of probation, that he possesses—

(1) Intelligence and aptness for his professional duties;
(2) That he has sufficient knowledge of practical surveying, of topographical and military drawing, for the purposes of the Department.

Rule IV.—A candidate on probation must, before confirmation, pass an examination in Hindustani by the first or Lower Standard of vernacular examination, laid down in section 23, Bengal Army Regulations of 1873, corrected as that section may have been or may be subsequently by General Orders.

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N.B.—The candidate, before promotion to the first grade of Assistant Superintendent, will be further required to pass by the second or Higher Standard of vernacular examination, laid down in section 23, Bengal Army Regulations.

Rule V.—Before confirmation in the Survey Department, the candidate will also be required to pass a professional examination by the Higher Standard laid down in G.O.G.G. No. 531, dated 27th June 1864.

Consolidated Pay of the Grades of Survey of India Department.

						RS.	
Deputy Superintendent,		1st grade	...	...	...	1,600	per mensem.
Do.	do.	2nd ,,	...	...	...	1,300	,,
Do.	do.	3rd ,,	...	...	...	1,000	,,
Do.	do.	4th ,,	...	...	...	850	,,
Assistant Superintendent,		1st ,,	...	...	...	600	,,
Do.	do.	2nd ,,	...	...	...	500	,,
Do.	do.	Civil Probationer	...	...	...	400	,,

Extract G.O.P.O. No. 244, *dated* 19*th April* 1851.

1. *Writing from Dictation*—Each candidate will be required to write English correctly from dictation.

2. *Arithmetic and Geometry.*—He should possess a competent knowledge of the ordinary rules of Arithmetic, including the rule-of-three, compound proportion, simple and compound interest, vulgar and decimal fractions, and the extraction of the square root. He should also have read the first three books of Euclid.

3. *Latin.*—In languages, he should be able to translate into English passages from Cæsar's Commentaries, or from the first four books of Virgil's Æneid, and he will be further expected to parse and show his knowledge of grammar and syntax.

French or Hindustani.—The candidate will be required to translate from French into English an extract from one of the following works, viz., Telemachus, Voltaire's Charles the XII, and Peter the Great. But the candidate will have the option of being examined in lieu of the French language, and in that case, he will be required to translate from Hindustani into English an extract from one of following works, viz., Bagh-o-Bahar, Toba-Kuhanee.

4. *History.*—In history, he should be prepared to pass an examination in Keightley's Histories of Greece and Rome, in Gleig's History of England, and in the History of British India contained in Vols. I and II of the Edinburgh Cabinet Library.

5. *Geography.*—In geography he should possess a competent knowledge of the modern divisions of the world, the principal nations in Europe and Asia, the names of the capital of each nation of Europe, the chief cities of Hindustan, and the names and situations of the principal rivers and mountains in the world.

FORM O. 28.

SURVEY OF INDIA DEPARTMENT.

Memorandum of Instructions for Applicants for the Junior or Subordinate Branch of the Survey of India Department.

1*st.*—Every candidate for the Survey Department of India must forward his application in writing to the Surveyor-General, accompanied by such certificates as to *age, moral character, education, soundness of health* and *good eye-sight* as will clearly establish his suitability for employment. The application must further be accompanied by *specimens of drawing*. The Surveyor-General will then, if he sees fit, fix the place and time of examination. The examination papers will be issued from the Trigonometrical office in Dehra Dún.

2*nd.*—No application can be entertained from any individual under the age of 18 or above that of 25; no person who is married or is likely to be soon married will be admitted. (This last proviso does not refer to candidates of pure Asiatic origin).

3*rd.*—Candidates must be prepared to pass the examination detailed below.

4*th.*—Priority of examination does not necessarily insure priority of appointment. When a vacancy occurs the Surveyor-General will select from the passed candidates the individual whom he considers most eligible.

5*th.*—When nominated to the Department the candidate must sign the Bond printed on the reverse of this paper.

6*th.*—Qualified candidates will enter the Department as Probationary Assistant Surveyors, 3rd grade, on a salary of Rs. 120 *per mensem*.

7*th.*—As Surveyors are liable to much exposure and to work in trying climates, the medical certificate should particularly specify that the candidate is of good physique and is likely to stand hard work, such as riding or walking long marches.

Abstract of Examination for the Junior Branch of the Survey of India Department.

CANDIDATES.			ARITHMETIC.	ALGEBRA.					GEOMETRY.	MENSURATION.	SECOND PART OF MATHEMATICS.				WRITING AND DRAWING.						
NAME.	AGE.																				
	Years.	Months.	Vulgar and Decimal Fractions and Proportion.	Square and Cube Roots and Surds.	Arithmetical and Geometrical Progression.	Simple and Quadratic Equations and Problems.	Binomial Theorem.	Total.	First Four and Sixth Books of Euclid with Problems.	Areas of Plane Figures.	Analytical Plane Trigonometry including the Solution of Triangles.	Use of Logarithm Tables.	Heights and Distances.	Total.	Handwriting and Writing from Dictation.	Military or Topographical Drawing.	Map and Plan Drawing.	Free-hand Drawing.	Handprinting or Map-writing.	Total.	Grand Total.
Maximum marks			100	50	50	100	50	250	150	50	150	50	50	250	100	50	100	50	50	350	1,150
Marks gained by Candidates			..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

SURVEYOR-GENERAL'S OFFICE,

Report by Examiner.

Orders by Surveyor-General.

SCALE OF SALARIES SANCTIONED BY GOVERNMENT FOR THE JUNIOR OR SUBORDINATE BRANCH, SURVEY OF INDIA DEPARTMENT

		Per mensem.						
Surveyor,	1st grade,	Rs. 500	with field allowance of	Rs. 4	per diem	while under canvas.		
Do.	2nd „	„ 400	„	„	of „ 3	„	„	
Do.	3rd „	„ 350	„	„	of „ 3	„	„	
Do.	4th „	„ 300	„	„	of „ 3	„	„	
Asst. Surveyor, 1st grade, Rs. 200, rising by five annual increments to		„ 250	„	„	of „ 3	„	„	
Asst. Surveyor, 2nd grade, Rs. 160, rising by five annual increments to		„ 200	„	„	of „ 3	„	„	
Asst. Surveyor, 3rd grade, Rs. 120, rising by five annual increments to		„ 160	„	„	of „ 3	„	„	

Assistant Surveyors whose pay is less than Rs. 200 will be considered to forfeit their appointments on marrying, unless they possess, or acquire by their marriage, sufficient means to raise their income to Rs. 200 per mensem, exclusive of local and travelling allowances.

AGREEMENT of _____

Probationary Assistant Surveyor in the Survey of India Department.

I _____ do hereby agree that I will not demand my discharge for three years from the date of joining the Survey of India and never during the Field Season. I further agree to serve in any part of India or Burma to which I may be sent.

If against the tenor of this agreement, my discharge should at any time be insisted on, I do hereby agree to repay to the Government a sum equal to one-half of the whole amount which I may have actually received in the shape of salary or allowance of any kind.

Signature _____

Witnesses to Signature { _____ _____

Place and Date _____

MEMORANDUM by Colonel DEPREE, on the Office Procedure of Topographical Field Parties.

The following procedure was adopted by me during many years in the drawing of fair maps. In my old Parties, No. 4 and No. 7, all my Assistants became more or less good Draftsmen, especially in the former Party; and the Assistant Surveyors, with whom I had to do when they were young, all learned to write a similar copper-plate round hand.

General remarks.

2. Some men of course could draw and print better than others, but still every man regarded it as his natural business to draw and print, and he forced himself to learn to be neat and methodical, if not artistic.

The necessity for Europeans taking a lead in every process in an office.

3. I may here remark incidentally that my numerous late inspections show me that the tendency of the European Surveyors is to stand and look on while the Natives are made to do the drawing and hand-printing, as if they thought themselves quite above that sort of thing. This is a mistake, and it cannot be permitted for the future. Besides it is suicidal for the Europeans to admit that Natives can do any one thing better than themselves. They should claim to be superior *in every thing*, and only allow Natives to take a secondary or subordinate part.

4. Here I may again remark another mistake which seems to me to have crept in of late. I noticed in one of the monthly reports that a Sub-Surveyor—quite an inferior one too—was employed through the month in computing latitudes and longitudes. Now this work forms perhaps that part which may be termed "Scientific," therefore it ought to be done by the best workmen, for on its accuracy the whole work depends. It is contrary to common sense to entrust that work to an inferior-paid Native, and only the Europeans, who had shown their knowledge of Mathematics, when examined before admission, and therefore were presumably the most intelligent men in the Party, were allowed to take part in the original computations.

5. In my old Parties I never permitted a Native to touch a theodolite, or an original computation, on the principle that the triangulation, or scientific work, was the prerogative of the highly-paid European; and this reservation of the scientific work was the only way by which I could keep up a distinction, so as to justify the different figures of pay respectively drawn by the two classes, between the European in office time, and the Native who ran him so close, in all the office duties, as well as in field duties.

6. Yet I see that Natives commonly do the computations now-a-days, and the Europeans some other inferior duties.

7. In the above remarks I refer to Topographical Parties with scientific work, and not to the purely mechanical computation of traverses. Here Natives must be employed for economy's sake.

8. All the Assistant Surveyors come to the Department with a certain acquired power of drawing; without it their applications are summarily rejected. It remains for these new hands to qualify still further, and to be always improving. The contrary has been the fact in many cases; they have been permitted to drop all drawing and lose even that power they had acquired.

9. There is nothing more wearying to a man, specially if he has an active brain, than to be put to draw, or print, simply "for practice." Hence to give him an interest and to allow of his improving, he should always be given work which is useful, and of permanent value, thus :—

Method of acquiring good hand-writing.

(*a*). If a man is a bad writer let him be given computation sheets to copy in duplicate, or official letters. He will then try his best, and probably acquire a good hand. He will be ashamed to have his imperfect calligraphy in perpetual evidence.

Method of acquiring good hand-printing.

(*b*). In hand-printing, let him take the computation sheets, title pages, &c., and employ himself usefully in printing up the headings and names of stations, &c. He will here obtain unlimited practice, and be doing valuable work at the same time, on the scientific record of the work of the survey. He will therefore take pride in his work, and *gradually improve.*

10. There is another practical advantage in this, and it is as follows :—The best way to teach one's self to hand-print well, is to learn to make the letters of the proper shape, and slope. This is surest done by *beginning* with *large letters*: for every turn and finish of a letter of large size can be readily seen; and it is easy to obtain a good slope by means of guides, as described in (Circular Order No. 166 or) Departmental Order No. 2, Professional.

11. When a man can form large letters evenly then he may try letters of *smaller size*, until he attains the smallest size. This can be done by almost every one, and it must be done unless a Surveyor allows himself to fall behind in the race.

Method of acquiring artistic hand-printing by varied practice.

12. As soon as a Surveyor can do this much well :—(*a*) Let him have the field sections given to him to print the headings and foot-notes. If he does do them imperfectly, he will be improving, and the imperfections will not matter. (*b*) Next give him the Standard Sheets, and let him

print the foot-notes: if they are not neat it will not much matter, as they are cut off in the Photographic office, and type substituted, as I regret to say is the practice. (*c*) Then let him print the degree Sheets of Triangulation. (*d*) Lastly, give him a Standard Sheet to print the names of villages. In this way the object of hand-printing will be acquired by most men, gradually and surely.

Drawing of Fair Maps.

13. As to drawing fair maps, the first rule is that no map should be entirely completed by one man, because, (*a*) for example, he who is artistic enough to draw the hill features and hand-printing, would be quite improperly employed in doing the simple pencil outlining; his services would be thrown away. (*b*) No one man can do every thing best. And (*c*) whatever work a man can do best, that particular work should be entrusted to him. Hence every map should be the work of many hands.

14. As to the work which each hand should undertake in the fair mapping. It may be divided into the following:—

(1). Pencil outlining by tracing, pentagraphing, &c.
(2). Pen drawing in outline, rivers, village polygons, &c., symbols, trees, temples, &c.
(3). Hand-printing village names, ordinary, &c.
(4). Do. district, special town names, &c.
(5). Hill drawing, horizontal or vertical.
(6). Finishing, old English printing, headings, &c.
(7). Border-lines and scales.

Methodical gradual teaching the drawing of "fair maps."

15. There is nothing required but care for item (1). Therefore any Surveyor may undertake this work however unskilful he may be. Let him remain at pencil outlining until he has shown that he may be trusted to do item (2). He probably will very soon be dissatisfied with such inferior or simple pencil work, and show that he *can* perform the nearly as easy drawing of lines in pen and ink; and the more difficult one of symbols will follow.

Hand-printing.

16. Then (3) hand-printing,—if practised in the computation sheets, the Assistant will soon find it monotonous, and show that he can do it equally well on a map. He will next show that he may be trusted with a fair Triangulation Chart, or even a Standard Sheet, and be gratified with the change. The item (4) will follow as he becomes more of an adept.

Hill drawing and contouring.

17. Next hill shading, or contouring. Beginning with the largest scale maps, *vide* Departmental Order No. 4, and learning to draw true contouring in even plain lines,—an art which no one surely can be so unskilful as to be unable to acquire,—his next lesson will be to draw the same lines on just half the scale; his third lesson to repeat the same lines on half the scale again, when he will find that he has become insensibly an accurate, and probably a neat, and possibly an artistic hill Draftsman, or has compassed (5).

18. The "finishing" or (6) obviously will be done by the artists of the party.

Border-lines.

19. The border-lines-drawing may be practised by ruling the (*a*) field sections, (*b*) borders of Triangulation Charts, (*c*) and lastly of the Standard Sheets; all border-lines on each set of Standard Sheets *of one season* should be done by one or two men, so as to secure uniformity. (4) Paper "gauges," used as stencil plates, should everywhere be employed for borders so as to secure absolute uniformity.

The time of a skilled Draftsman should be spared by employing inferior men to prepare his work for him.

20. The artist Draftsmen may be relieved of the mechanical process of ruling the pencil lines for hand-printing; this should form the work of an inferior hand, who can at least rule pencil lines at proper intervals on a map. Paper "gauges" for proper intervals of upper, middle, and bottoms of letters should always be used; and "guides" as well so as to secure an uniform and proper slope.

21. If a Surveyor proves to be quite incapable of drawing, or printing an ordinary map, he should be reported as inefficient, in this essential, and it will then become a question whether he is to blame; or whether his services should be utilised in some other way; or whether he should be superseded by his juniors, who do possess the skill, and the will, to perform this essential of a Surveyor's profession. Let it be remembered that every man, when he entered the Department, passed a drawing test, therefore there is no reason for any one turning out an absolute incapable in drawing.

From Colonel G. C. DePREE, S.C., Surveyor-General of India, dated Calcutta, 9th December 1885, No. 11.

SUBJECT.—*Office Procedure in Drawing Standard and other Fair Maps.*

It having been stated more than once by Executive Officers and other Surveyors that fair mapping and hand-printing have been taught and practised with difficulty, and have failed in uniformity and in excellence, owing to the absence of definite rules (to lay down exact rules for so many various and minor processes, all terminating in a finished artistically drawn map, seems a task perhaps not attainable, but still there is much in common in the procedure of map drawing in the field parties of all three Branches of the Department); the Surveyor-General therefore would endeavour to meet the difficulties of the question by circulating a memorandum embodying his experiences, whereby amongst his Surveyor Assistants, some Draftsmen attained artistic skill, others reaching mediocrity only, but all without exception learned to take part in the fair mapping, and became neat, passable hand-printers.

NOTE BY SIR EDWARD BUCK, C.S., *Kt.*, SECRETARY TO THE GOVERNMENT OF INDIA, REVENUE AND AGRICULTURAL DEPARTMENT.

The examination of the officers of the Survey Department by the Sub-Committee has been forwarded to me for note and early return. I shall therefore confine my observations to the one point which I consider to be the most important.

This Department has met with some opposition in its attempts to introduce Natives into the Survey Department, *i.e.*, into anything like responsible or well-paid appointments in the Department. The failure seems due to the opinion that however fit Natives are for the mechanical work of the Department (as testified in this evidence) they are not qualified for responsible posts in which they would have to organize and inspect. This idea is brought out in the question and answer by Colonels Thuillier and Haig on page 2 of the papers.

But my experience confirmed by the replies to the President in Colonel Haig's evidence is that no sufficient attempt has been made in the Survey Department to employ Natives of a class fitted to supervise, or to give them an opportunity of being trained. It is different in the case of Europeans. They are to begin with more or less educated men of decent position, are put in at once into a grade which carries with it more or less responsible duties, and are (whether called apprentices or not) allowed a certain time to learn their work. They are all men who are more or less likely to be good Overseers, or even to become fit to take charge of a Party. On the other hand, the only Natives (with, I think, one exception) put up into the Junior Division have been men of the class described in the earlier paragraphs of page 2 of Colonel Haig's evidence, who of course being uneducated and belonging to the class which is accustomed to obey not to command, are not likely in their old age to turn out good Supervisors.

It is, however, not fair to impute much blame to the officers in charge of the Survey Department. They do not know where to turn for the men they require. They have some assurance when they put a European into training that he will possess certain qualities—innate in a European—on which they can depend, viz., more or less energy and perseverance, pride in good work, &c.,—qualities which are not met with in a Native with certainty.

The fact seems to be that as with the Subordinate Revenue Service, so with the Survey Department, a training field from which to select is required. Here again I would revert to the scheme put forward in my own evidence in connection with the selections of Natives for Tahsildarships and other appointments in the Revenue Service, and would strongly recommend that the corps of Revenue Inspectors and Kanungos be utilized as reserve from which to draw Survey officials. As Overseers of Patwaris they are from the first accustomed to supervise and command and they are all required to know elementary surveying. If any effect is given to the suggestions in my evidence they will also be men of decent family and good education. I assert that if a few of the best of these men, after having had a year or two's trial in the Kanungos corps, are selected for the Junior service of the Survey Department, the chances are that they will turn out competent Supervisors.

I cannot repeat too often my opinion that the failure which has occurred in all branches of our Administration to get good Natives for responsible posts has been that the choice has lain between, on the one hand, men who have risen from the ranks who never entirely lose traces of their servile habits and who are consequently more or less unfitted to command, and, on the other, men who although of good family and education are untried in the field and generally fail either because they are really incapable or because they have had no training. The examination of every Department shows the necessity of a training field for educated Natives from which to select the fittest.

Even the Cirencester students who returned to Bengal could get no employment till I personally arranged that some of them should be trained as apprentices in the Settlement Department in the Central Provinces for a season. Now these same men are doing valuable work as Settlement Deputy Collectors in Bengal. It is not fair to expect the B.As. of the country to be useful employés unless they have an opportunity of showing their capabilities and of learning administrative duties in some training field or other. For the Survey Department I can, as I have said, suggest none better than the 4,000 or 5,000 Revenue Inspectors and Kanungo appointments throughout India.

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I hope that nothing I have said will lead to the conclusion that Natives can do all the Survey administration done by Europeans. Notwithstanding the simplicity of field survey, yet the organization and strict care which a large survey requires necessitates superior control of a high order for which the training and talents of our best-educated European Survey officers are needed.

I may give Bengal as an instance. For some years their field surveys were locally organized and although they possessed the services of one or two Native officials who showed much ability, yet in 1884, after a prolonged inquiry and discussion, the Government was obliged to admit that the assistance of the Professional Survey Department was necessary; a compromise has since been effected under which the whole framework of the Survey and the organization of the work is conducted by the professional officers, while the details are filled in and completed by local Native officials trained under the professional Supervisors. But it may be said that experience in Bengal has done much to prove that important surveys must be (for the present) controlled by Europeans.

Further Note by Sir EDWARD BUCK, C.S., *Kt.*

The statements made by Mr. Parbati Churn Roy require considerable modification. The work conducted by him followed upon a framework of boundary points fixed by the Professional Survey Department, and was therefore comparatively easy. This circumstance is referred to in Colonel Sandeman's evidence before the Public Service Commission.

It is, however, sufficient to say that General Walker, then Surveyor-General of India, disposed of the case by showing that the work done by the writer of the note was only one half the work performed by the Survey Department, and that the comparison of the rates was absolutely fallacious. As a fact his rates were not lower than the ordinary Survey rate for such work, while his work being founded on the basis of the Survey traverses was not of an original or scientific character. In the representations made by Mr. Parbati Churn Roy the fact is not noticed that use was made of the of the Professional Survey.

The merits of Survey work conducted under Native superintendence were very fully discussed by the Bengal authorities in anticipation of the Behar Survey in the year 1884. The opinions of many officers were taken, and Parbate Churn himself was permitted to submit a long note on the subject. The Bengal Government, however, decided (in a letter of 25th October 1884), that the survey must be conducted under professional agency, and Mr. Parbati Churn Roy's claims were practically put on one side, in complete concurrence with the views and policy of the Government of India as expressed in its Resolution on Survey in 1882.

The Dearah Survey proves in fact little or nothing. The work was not of very high class character, and does not of itself show whether a Native officer would have been capable of higher class work. But as a matter of fact Mr. Parbati Churn Roy was an untrained Native and therefore just as unfit for the conduct of important survey work as an untrained European. There is no officer of the Survey Department who would have been competent to take charge of a Revenue Survey Party without some years' apprenticeship, and there is no reason to suppose that a Native, however able, can any more than our professional officers undertake important Survey work without adequate training.

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Section III.—Sittings at Simla.

Witness No. I.—10*th June* 1887.

Examination of Colonel C. T. HAIG, R.E., Deputy Surveyor-General, Trigonometrical Branch.

The *President.*

When did you enter the Department?—In October 1859. I have served in the Department ever since.

In what parts of India have you principally served?—Chiefly in the Bombay Presidency, Gujarát for a great number of years, and in Kathiawar, having also gone rapidly in purely Trigonometrical Survey over a considerable extent of country from Oodeypore to Goá, and to the Nizam's territory.

Do you consider it necessary that there should be so large a proportion of Military officers in the upper division of the Department?—I do not see how we could possibly do with less on account of the difficulty referred to in Colonel Thuillier's note of finding the requisite number of Executive Survey officers for Military requirements and operations across the frontier.

Can you give us any instance of that difficulty having been felt?—I was thinking of the different men whose services were applied for and had to be refused, some on account of ill-health and some because they could not be spared.

Were not demands made upon you for Military officers during the recent campaigns in Afghanistan and Burma?—There were a great number of officers whom the Department was called upon to place at the disposal of the Military. I believe fourteen Military officers of the Department were serving in Afghanistan during the war, viz., Colonels Heaviside, Holdich, Beavan, Campbell, Woodthorpe and Tanner; Majors Rogers, Strachn, Gore and Talbot; and Captains Hobday, Martin and Leach. Difficulty was experienced at the time in getting particular officers for particular posts. For instance, an officer was wanted to go to Suakim, but to his own astonishment the Doctors would not pronounce him fit, and it was that an officer after considerable difficulty was found who was fit to undertake the expedition.

Are you not now giving instances of the difficulty of procuring officers in the Department fit for active service rather than showing be necessity for having Military officers in the Department?—I wanted to show that even with the number of Military officers we had in the Department it was not an easy matter to meet the demands that were made on us. When I say that a demand is made for officers in campaigns across the frontier, I wish to be understood as meaning, that when Military expeditions are organized, advantage is taken of the opportunity offered for extending the operations of the Department beyond the limits of British India. Irrespective of Military duty we had five Military officers on special duty of a political nature, viz., one with the Gilgit Mission, three with the Afghan Boundary Commission, and one was attached to the Thibet mission, and remained with it for some months.

I observe that a portion of the men in his Senior Division of the Department are Civilians. Where were they educated?—Three of them were educated in England. They were appointed for special purposes.

What special functions do they discharge?—Two of them were appointed for their mathematical attainments; one was a Senior Wrangler at Cambridge, the other was Senior Optime, a third was brought in from the Madras Survey Office for his attainments in Chemistry and his scientific knowledge of Photography. One of these appointments was made by the Secretary of State. The other Civilians, nine in number, were promoted from the Junior Division.

Were these nine men educated here or in England?—With the exception of two, who were probably educated in England, they were, I believe, all educated in India; three of them are Eurasians.

What is your opinion of the qualifications of these gentlemen as a body?—I think they do very well as Assistant Superintendents.

In what respects are they inferior to the Military officers in the Department?—In education generally. Four of them were selected from quite low down on the Junior List on account of their being specially well educated, but the others were promoted from the top of the Junior Division to which they had risen by seniority; that is to say, under circumstances which would in all probability compel them to retire before attaining to the grade of Deputy Superindendent.

Are they inferior as regards their professional qualifications to the Military officers?—Their education has been much more confined to details; they have not the broad view of things in general that Military officers have. Their whole education has been more restricted to the work on which they have been employed.

Have you had anything to do with Revenue work?—No.

I see you have one Hindu and one Mahomedan in the Junior Division. Have you had any

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personal experience of Natives in the Junior Division ?—No.

I believe the Sub-Surveyor grade is mainly composed of Natives ?—Almost entirely so.

How is their work done ?—Very well indeed.

If they had received a better general education, do you think they are men who would be capable of receiving a higher degree of technical instruction, or are they the kind of men who would never be fit for other than subordinate appointments?—Our Sub-Surveyors are obtained, as a rule, from the lower class of Natives who are content with small pay.

From the Mistri class ?—Yes; many of them not even from that class.

The Hon. Mr. *Quinton.*

What pay do they commence on ?—From Rs. 12 to 15.

The *President.*

I suppose the class they are taken from is the same as that generally employed in the lower clerical grades ?—Yes.

Have you had any men working under you who had been educated at the Engineering College at Poona ?—I had one such man; he did very well as a Sub-Surveyor.

Do you think he would have been qualified for promotion to the higher branch of the Department ?—Yes, to the Junior Division. I recommended him for promotion; but he, I think, was a very exceptional man.

What was his caste ?—He was a Mahratta Brahman.

What has become of him ?—He had to retire owing to ill-health.

Does the work of Deputy and Assistant Superintendents involve considerable exposure, and have they to supervise the operations of a large staff and to travel any great distance from place to place ?—In pure trigonometrical work you have a great deal of travelling; in topographical work your moving about is much more confined to a certain area within a district, but then you have also a great number of hands to supervise. In trigonometrical work the Executive officer has to do a great deal of the work himself, in fact all the chief work.

Have you met any Asiatic Natives whom you think would be fit for these superior Executive appointments ?—I have never met one.

In what respect do you consider they would fail ?—A great deal of trust has necessarily to be placed in an Executive officer, not only as regards the expenditure of money but in regard to conflicting claims to promotion between Government employés, and a great deal depends upon the integrity of the officer in charge. It is not like the work of a stationary office where promotions are made and expenditure incurred as a matter of routine. I think you would always be inclined to be doubtful about the expenditure incurred and the advancement of individuals made by a Native executive officer.

Looking at the matter from a professional point of view, in what respect do you think Asiatic Natives would be unsuited for the Executive branches of the Department ?—I think that as long as they were given very definite orders they could be trusted to carry them out, but from my experience of them, I think they would fail in independent charge where they would have to fall back on their own resources and their own originality.

As regards care and accuracy in details, which do you consider superior, the Asiatic Native or the European ?—For the mere details of Survey work I cannot say which is the more competent, but I think the Native is quite competent to do work of that kind, and we employ them largely on it; of course the European could do it quite as well, but he is an expensive agency and is better fitted to supervise and check the work of the Natives.

Lieut.-Colonel *Thuillier.*

Supposing you employed a Native and a European on the same class of work, which of them would do it the most faithfully in the absence of supervision ?—There can be no question about that — the European would. We employ the Europeans and Eurasians in the Junior Division to supervise the Sub-Surveyors.

The *President.*

You appear to employ a very superior class of Natives as Sub-Surveyors ?—I have had no experience of the Natives who would be proposed for appointments in the Junior Division.

You say the Sub-Surveyors commence on Rs. 10 to 15; what is their highest pay ?—Rs. 110. They are never promoted higher; but there is no rule that I am aware of to restrict them to Rs. 110.

Are they ever promoted to the Junior Division ?—The two now in the Department were promoted to the Junior Division. There has never been any rule to debar them from promotion that I know of.

The Hon. Mr. *Quinton.*

How long does it take them to rise to the maximum pay ?—It depends entirely on their abilities and qualifications. There is no graded list of Sub-Surveyors. Their pay is increased according to their qualifications.

The *President.*

What are the duties of Surveyors in the Junior Division ? Have they any superintendence, any original work ?—They have the superintendence and the checking of the Sub-Surveyors as well as original work.

When, comparing the Asiatics with the Europeans in the Department you said that you considered the European the more trustworthy. Did you refer to the Military officers and the Senior Division generally or to the Junior Division ?—I referred to men in the Junior Division. I may say that they are all trained to work accurately, and that it is only the stupid Native who will "fudge" and only a very bad European who will ever try to do so. There is nothing to be gained by fudging. I remember one European was turned out of the Department for it some years ago, but his was a very exceptional case. There is a great deal of rough work to be done

in the junior grades, which the ordinary Native thinks it *infra dig.* to do with his own hands; he wants a coolie to carry things for him. The more highly educated Native thinks himself too much of a gentleman to work with his own hands.

Do you think it desirable to throw open to Civilian appointments in the Department to public competition?—My opinion would be very strongly against doing so. There are so many qualifications necessary which cannot, I think, be brought out by a competitive examination.

When I spoke of a competitive examination for this Department, I meant an examination which would test a man's practical work outside the examination room as well as an examination on paper?—I do not think there is any race objection to the employment of Natives, though hitherto I have never seen the Native that I thought would make a good officer in the Department. One thing I may mention is that it is so difficult to find out who a Native's friends are; we know who the friends of the others are. If the European or the Eurasian is dishonest or tells a lie, he is given the cold shoulder by his own friends. If Natives are to be appointed I would have a qualifying examination.

Lieut.-Colonel *Thuillier.*

Would you prefer nomination or competition?—Nomination.

The *President.*

The difficulty which you suggest as involved in the competitive system as a means for securing the best men for the Department is also put forward as the principal objection to the nomination system, viz., that the nominating authority cannot possibly know the merits of all the men who would apply for service in the Department, that in point of fact its knowledge either of their attainments or of their moral character would not secure the selection of the fittest man, and that, therefore, an examination, which would at least test the abilities of the candidates would secure at any rate intellectual fitness for the appointment?—My idea was that the nomination would be made by some officer acquainted with the candidate and his family.

Would not the selection, therefore, depend on whether the nominating authority knew the man or his family?—It is not difficult to find ability among Natives; the thing is to find a Native who will use his ability in the interests of the Department, and not too much in his own; and I think nomination will operate against that difficulty.

The Hon. Mr. *Quinton.*

Do you nominate European apprentices for the Junior Division?—No; a man is appointed direct on passing the qualifying examination.

Does he go through any period of probation?—Not in the Junior Division.

Sir *Edward Buck.*

Are there not in the Junior Division young men called apprentices?—Not in the field.

Witness No. II.—10*th June* 1887.

Examination of Major J. E. SANDEMAN, Deputy Superintendent, Survey of India.

Major J. E. Sandeman.

The *President.*

How long have you served in this Department?—I have nearly 26 years' service in India and nearly 23 in the Survey Department, having been appointed in October 1864, after passing through the Rurki Civil Engineering College.

I have served in the Central Provinces, Oudh, Punjab, North-Western Provinces, Bengal, Behar, Chota Nagpore, Assam and Burma.

I have surveyed on the 4-inch scale in the Central Provinces, Bengal, Oudh, and the North-Western Provinces on the 2-inch and 4-inch scales in Assam and in the Peshawar and Huzara Districts of the Punjab, and on the 16-inch scale in Behar, Chota Nagpore, Burma and the North-Western Provinces.

For 11 years I have been in charge of a party, and for the last 4 years have been preparing a Record of Rights and making a Cadastral Survey in the Gorakhpur District, North-Western Provinces (*reads*).

The total annual expenditure of my party is close on Rs. 1,60,000. The party is divided into three camps, the Traverse camp, which is under a European Surveyor, and has an establishment of about 300 men; and the two Cadastral camps, each under a European Surveyor, having each an establishment of about 500 men.

I am also carrying on an experimental survey entirely through Patwari Agency in the Tarai District. The outturn of the Traverse camp is 1,160 square miles, containing 1,650 village polygons, divided by 765 sub-traverses. The chain measurements amount to 3,500 linear miles and the angular observations with the theodolite (each repeated three times) to 21,000. To check deduced bearings 127 azimuth observations were taken, and to confine the error of the chaining, 7 connections were made to G. T. Trigonometrical Tower Stations.

Permanent marks were embedded at 14,602 theodolite stations, of which 8,820 were stones and 5,782 clay cylinders. The "setting up" and proving the angular work and azimuths and checking the computations at every stage of this large amount of work involve an immense deal of labor, and to be successful the officer in charge must be a master of his work and devote himself to it from daylight to sunset and even longer at times. The work is very fascinating, as the results at every stage prove mathematically, but it is extremely laborious and if the angular error is not carefully distributed it is apt to accumulate in a way which necessitates the redoing of several days' work or "forcing" which is applying more error in places than is permitted.

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Thus an officer must have integrity not to spare himself at the expense of the work.

Such a mass of chain measurements also give him a vast amount of trouble to balance and to judge where they are faulty.

Constant attention and constant reprimand to keep the men up to the mark and good judgment are necessary to ensure uniformly good results.

The field establishment of the Traverse camp costs about Rs. 2,700 per mensem, and consists of 2 Europeans, about 26 Boundary Surveyors, Computers, and Plotters, 11 line Cutting squads, 1 Main-Circuit and 1 Sub-circuit squad and 12 Village circuit-squads and 8 Stone embedding squads.

The recess establishment costs about Rs. 850 per month and consists of 2 Europeans, 15 Computers, &c., and a few Kalassies. The Officer in charge of the camp is responsible to the Deputy Superintendent, who himself being responsible to the Deputy Surveyor-General checks the work, as he finds time, for his own satisfaction. The post of the Camp Officer is one of great responsibility, and he must closely watch his 300 men if he aims at success and to prevent all falsifications of lines and angles.

He must be careful in the selection of his establishment, in examining his instrumental equipment and he must be active in the field, and in addition to doing his own share of the computations and field work must visit the men at work, more especially when disputes exist to prevent as far as possible the extortion of money from credulous landlords.

The field survey outturn of my party on the 16-inch scale is 1,688 mouzahs, area 1,060 square miles containing 960,400 fields, besides 20 square miles of Forest Survey on the 8-inch scale and 75 square miles of 16-inch survey in the Tarai District and 66 square miles Riverain survey on the 4-inch scale.

The Cadastral Camp Officer has under him the following establishment:—

In the Field.	*In Office.*
1 European Assistant.	1 Head Munsarim.
2 Head Inspectors.	6 Munsarims.
12 Inspectors.	120 Mohurirs.
110 Field Surveyors.	10 Menials.
250 Chainmen.	
375	137

The total establishment being over 500 men. During the recess season the Field establishment is dismissed, but the Office establishment is increased according to the requirements of the Assessing Officer. The Camp Officer's first important duty, on the field being taken, is to engage the establishment with strict impartiality, so that all the attempts of men already in office to favour their relatives, &c., may be defeated. The success of the work depends on his securing the best material available, and he must personally examine the claims of each man, that no good man may apply in vain and that indifferent men may be sent away.

His next duty is to see to the equipment that it is serviceable and that the chains are well tested.

Another important duty is to allot the work; no subordinate must have a voice in this matter, for it is often necessary to send the best and most experienced men to the more distant and unpopular localities. An Inspector, to whom this duty has been partially left, has been known to auction his villages among the establishment.

Once the work is in full swing the Camp Officer's duties are incessant, and while the field season lasts he can hardly call a moment his own. The petitions for help in difficulties, for extra labour, complaints of the absence of Patwaris, of Zamindars and of Tenants, through intimidation of flaws in the papers of various kinds, of disputes between Zamindars as to ownership and between tenants as to possession or between Zamindars and Tenants, reports regarding bribery or oppression, such are some of the difficulties he must devote his energies to overcome, in addition to visiting the men where his presence is necessary in the field and controlling his large office establishment engaged on completing the maps, computing areas and offsets, filling up the village papers and extracting statistics.

Experience has shown us the hopelessness of putting a stop to bribery altogether, but when checked as far as it is possible by the presence of the European Officers it does not percolate to every portion of the establishment to such an extent as to render the work performed more or less valueless, but is only carried on under false pretences—money being taken while the correction for which it is given is not really made.

For the work is so thoroughly checked first by the European Assistants and finally by independent purtal when the map is lodged in office that the fear of detection is very great. It is impossible to make the Record of Rights absolutely correct for the influences at work in the other direction are too strong for us, but we do our utmost, and as long as the Tenant is not too weak to assert his rights we succeed fairly well. The European's presence encourages him to do this and he often travels miles to secure his attention.

It is not possible to enumerate all the duties the Cadastral Camp Officer has to perform. He has to pass the field areas of every Mouzah himself by applying the offset areas to the mathematical area of the polygon as furnished to him by the Traverse camp. He has to compare and pass all the check surveys, amounting to 800 linear miles in each camp himself. This season the check surveys in the Tarai District in the small area of 75 square miles amounted to 360 linear miles.

The comparison and passing of all boundary dispute maps with the original surveys has to be done by him before submission to the Deputy Superintendent. Owing to the want of care or honesty on the part of the men entrusted with the demarcation of boundaries as decreed by the Settlement Officer, he often has endless references to make over every such dispute, and we have known no less than 1,800 villages affected by disputed boundaries in one season due in a great measure to the defect of settlement maps.

Over all the work he must exercise the most strict supervision and see the results of one section independently checked by those arrived at by

other and independent sources, to guard against the extraction of any false statistics.

In a Cadastral camp preparing a Record of Rights bribery is to be guarded against from start to finish, and the Officer in charge must himself be absolutely above temptation and free from all caste and local prejudices to perform the work in the manner in which it is now being done.

The Deputy Superintendent, as in Gorakhpur, having to direct the work of a Traverse camp and two Cadastral camps and of a detached party in another district almost ceases to be an Executive Officer. He is responsible that the work is done in accordance with strict rules, and that it is of uniform accuracy up to a certain standard. He must have considerable experience to direct such operations effectively and economically, otherwise he is entirely in the hands of his subordinates. If he has not the necessary experience his interference is likely to spoil the work and disgust those who know what they are about. The Deputy Superintendent has much miscellaneous work to perform connected with boundary disputes and other matters. A list of the files kept in his Office and of the returns he has to submit is attached to this memorandum. He is also his own accountant while his annual expenditure is over a lakh-and-a-half. Much of his time is taken up with preparing estimates and returns for the Comptroller and others, and it is the utmost he can do to find time to check a small percentage of the field work and of the computations for the accuracy of which he is responsible.

This being so, it would be better to change the organization of Survey parties, and when an Officer reaches the grade of Deputy Superintendent, his executive functions might almost cease and his circle of control be so enlarged as to include all Cadastral Surveys in one province, or, if there is much work in progress, half a province. He might well have the work of three districts under him, the Survey party in each being in charge of a Surveyor, who should receive a small charge allowance in addition to his pay. As it is most desirable that all survey work should be done through the District Staff, the Subordinate agency should consist solely of Kanungos and Patwaris, whose training would be accomplished in the course of the operations. Thus all expenditure for establishment would cease, and the only cost incurred would be for a small and efficient instruction and supervising staff. In very many districts the mathematical data of the old 4-inch survey might be made use of and the triple junctions supplemented by sub-traverses running between them when villages are large, and this becomes necessary.

By these means the expenditure, which, at the lowest calculation, in the various current methods amounts to 100 or 120 rupees per square mile may be reduced to within 30 or 40 rupees, while reliable professional maps are produced under a professional guarantee, and the Patwaris are, at the same time, thoroughly trained to make annual corrections, so that at the next revision of settlement there need be no re-survey whatever.

I believe such a modification in procedure and organization would be of the greatest benefit to the country and the people.

The subsequent assessments also on this system might be made by the Collector or by any specially appointed officer from the papers only, which would result in economy on all sides.

Some such modification must be made if the professional survey is to aid in developing the improvements in revenue administration so earnestly desired by the Government, and to compete in cost with the ruder kinds of survey in progress in various Provinces, where the tendency is to confine the work of professional Survey Officers to traversing and training Patwaris while the supervision of the all important Field Survey is undertaken by the Settlement Officer. As the strength of the professional survey is in the experience acquired by its permanent controlling staff, it is not only reasonable to suppose that it will turn out cheaper and more reliable work than any less experienced officers, if the subordinate staff in both cases be the same; but this can be proved to be the case if the figures of work that is in progress are examined. The experimental survey I have been making in the Tarai District has proved (1) that the average Patwari is capable of surveying up to the professional standard; (2) that this result can only be arrived at under the strictest supervision.

Hitherto all non-professional surveys have been rightly considered too inaccurate to admit of the areas being obtained from the maps. No such attempt has ever been made, the maps have only been used as a guide to the relative positions of fields, the areas being obtained by local measurements, and it is only now for the first time that such a dangerous experiment is under trial. It would be far better to keep to the old system however faulty. It is to be feared that some day the results will appear very unequal and comparatively poor, and the cost is already much greater than there is any necessity for it to be. An accurate map must represent the *exact shape* of every field as it exists on the ground or it is nothing and unfit for area extraction, for a minute difference on paper makes a large difference in area.

The Officers of the Senior Division of the Survey Department, with the exception of a few specialists, consist of Royal Engineer and Staff Corps Officers and a small proportion of promoted Surveyors from the Junior Division. The latter is chiefly recruited from the hill schools. My experience of Surveyors and Assistant Surveyors is that as a rule they are an efficient body of men fairly educated, hard-working and well conducted. At the present time many of them have lost heart at the slowness of their promotion, due to many of the most important surveys being conducted under local establishments and the consequent periodical departmental reductions which take place; their minds are also unsettled by appointments being given in these surveys to some of their juniors, while they who have borne the burden of the work are left out in the cold. I would submit with all due deference that if the Department is dismembered the Officers for these local appointments be selected. As an instance of stagnation the average age of the Assistants in the first grade of Assistant Surveyors, salary from Rs. 200 to 250, is about 37 years, and their average service about 17; the

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age of the last of the Assistants in this grade is about 34 years and at the present rate of promotion he will be nearly 48 years old before he reaches the lowest grade of Surveyors. I have known one Native Assistant Surveyor, who was promoted from the Sub-Assistant Surveyor grade and is now dead. He was personally a worthy man, well-behaved and a good Surveyor and Draughtsman, but he could not have taken the place of the Europeans I have now under me.

I am of opinion that Natives should be employed in all positions for which they are qualified, and as a subordinate agency I would use them exclusively, for they are capital Surveyors, as long as their work is properly checked. But a perusal of the foregoing account of the duties which Survey Officers in the superior grades have to perform, whether the system be the old one or be modified by the utilization of Patwaris under professional supervision, will make it evident that they must possess certain qualities in an eminent degree. They must be above all money considerations, caste prejudices and the influence of family ties. They must have great integrity and honesty of purpose; be self-reliant and full of resource, for there is no hard-and-fast rule to guide a Surveyor; he has to judge by local circumstances year by year as to the best course in difficulties as they arise.

He must be physically strong and capable of undergoing hardship and self-sacrificing from a sense of duty. Personal discomfort should not make a Surveyor scamp his work of inspection and purtal in the hot months of April and May, and if he has to undertake any difficult surveying himself he should be conscientious enough to do it faithfully, although knowing it may not be checked, whatever trouble each dot and stroke to represent the features of the ground gave him. In fine, to perform the field duties of a Surveyor as well as the European, the Native must be morally and physically as strong and must labour with a sense of duty only, as my Assistants do. I have not yet met the Native that I would back to appreciate the necessity for or to exercise the constant vigilance over the work which they do. I am under the impression that their moral code is somewhat different from that of the European. But if Natives can be found with the same strict integrity and with the same powers of control and resource as Europeans, then they ought to have an equal chance of all appointments, high and low in the Department, which are open to Civilians who are specialists, and to members of the Junior Division. They ought, at any rate, to be tried in the Junior Division of the Department in a certain proportion, but in this case they should possess the same educational qualifications as the Europeans.

Had you any other professional education than that you received at Rurki?—I was first of all at Addiscombe. I gained the prize for military topography, which was one reason for my being selected for the Department.

Has the course of education at Rurki more advanced than it is now?—In those days Officers were allowed to go through a two years' course, and after that, there was a regulation allowing them to go through a six months' survey course, but I believe the rules are now altered.

Have you had anything to do with Surveyors in the Department who were educated at Rurki?—I have had some men of that class as subordinates now and again, but I cannot recall their work.

Do you know anything of the Native gentleman who has been mentioned as having conducted a Survey?—I do not recollect his name, but I remember the case of a Native who did some Dearah Survey in the Brahmaputra I think for the Government of Bengal. I remember being shown in our office one day a number of sheets which purported to be the work of a Native, and that it was pointed out by a brother officer that the whole or the greater part of these sheets had been transferred from his Survey of India maps. Of course there was a certain amount of original work in them; but it is not the custom to transfer work from our maps and take credit for it as independent work. I have a distinct recollection of this, and if the sheets are still in the office this can easily be verified.

What system can you suggest as the best for appointing to the civilian appointments in the Department?—As far as possible I would make no distinction between Europeans and Natives, and I think that if competition was protected by two or three years' probations it might be allowed; but otherwise I think the Survey department is one in which a man who passed the highest in a competitive examination might be the worst man you could get for the appointment. Officers in both Divisions of the Department have always hitherto been selected for their qualifications. No man would be appointed to either Divisions unless the Surveyor-General's opinion of him was that he was thoroughly qualified, and therefore when a vacancy occurs and an examination takes place the Executive Officer who examines the candidates is bound to state the opinion he has formed of each candidate during the examination.

Is the necessity that has been felt for selection as well as an examination test, the reason for the rule which declares that the candidate who stands highest in the examination will not necessarily get the appointment?—Yes. Of course the advantages of competition are many, and I think, that if the appointments are thrown open to competition, Europeans and Natives might compete together so long as care is taken not to admit too many of the latter.

Can you tell us whether the Revenue Surveys in the Presidencies of Bombay and Madras are under the Surveyor-General or distinct?—They are quite distinct. They have complete establishments for doing the whole work under the control of the Local Governments. In Madras I know there is an Officer who corresponds to a Deputy Surveyor-General.

In the Bengal Presidency the Surveyor-General has charge of the Revenue?—It has always been so. The Madras and Bombay Surveys are as I understand, from present reports much more complete than ours.

How is that?—Theirs is a very expensive but a most complete system. The whole thing is done by special departments down to the assessment, which is done by the Settlement Officer, whereas on the Bengal side only a very small portion of the large scale surveys are under professional supervision. I do not mean to say that the

Madras surveys are better than these latter, but they are far superior to the surveys being made under Settlement Officers and Deputy Collectors in this Presidency.

Under the present system are Europeans appointed to the Junior Division of the Department required to undergo probation before being definitely appointed?—No. They are trained in the Department after they enter it. No technical training is required from them beforehand, except a certain knowledge of mathematics and skill in drawing. Within the last six months or so I have given temporary employment to a European, who has passed the qualifying examination for the Department but cannot obtain an appointment, as vacancies are no longer filled. The case is quite an exceptional one.

When you said you would not object to recruit the service by a competitive examination followed by probation, were you referring to the Junior Division only?—Yes.

Would you make any change in the method of appointments to the Senior Division?—I would not. My own opinion is that the higher Officers of the Survey should be Military men as in all other countries, but I would not object to promoting a certain proportion of civilians from the Junior Division to the higher appointments as an encouragement to them; and as a rule, I think, whatever appointments are available for civilians in the Upper Division should be given to men promoted from the Junior Division except when specialists are required. Natives entering as civilians should only enter the Junior Division unless as specialists, when they might be appointed directly to the Senior Division, and should have an equal chance with others of promotion to the senior grades.

You would appoint to the Senior Division by selection and not by seniority?—Precisely.

Is your Cadastral Survey work sufficiently minute to form the basis of a land register?—I have been making a land register for the last four years.

Do you consider your work sufficiently minute to allow the introduction of a system of registration of title without further survey?—Where there is cultivation it is so, but not in towns and cities. The scale would have to be made larger in order to register accurately parcels of land in towns and cities.

Witness No. III.—10*th June* 1887.

Examination of Lieutenant-Colonel F. CODDINGTON, Deputy Superintendent, Survey of India.

Lieut.-Col. F. Coddington.

The *President.*

How long have you been in the Department?—I have been for over 25 years in the Revenue Branch of Survey Department and have been employed in Oudh, in Central Provinces, in the Bombay Presidency, in Surveyor-General's Offices in Calcutta, and in the Punjab. For the first year I was employed as an Assistant in a field party, and during the rest of my period of service (except when in the Surveyor-General's Office for 5 years), I have been throughout in charge of a Survey Party, which is the unit of an Executive Officer's charge. I have done survey work of almost all kinds except Cadastral (*reads*).

The annual expenditure of a Mauzawar or Topographical Party, such as I have usually held charge of, is from about Rs. 60,000 to Rs. 70,000. It usually consists of from 4 to 6 European or Eurasian Assistants on salaries ranging from Rs. 120 to Rs. 500 per mensem, about 25 to 30 Sub-Surveyors on salaries ranging from Rs. 11 to Rs. 70 per month, and of about 250 menials or measuring Kalassis, of whom about 75 would be on the permanent list.

The Executive Officer has direct charge under the Deputy Surveyor-General of the conduct of all the professional duties, as well as being held responsible for drawing and payment of all salaries, the preparation of all records and returns. He must possess a good practical knowledge of mathematics, extending to Astronomy, he should also possess a fertility of resource to meet the many contingencies that arise, with the variations of country he is required to work in; he is in constant correspondence with the Civil Officers of the Districts in which his work is proceeding, and has also generally to see that all the Departmental rules and regulations are complied with.

The operations of a year are divided into two distinct periods: 1st the "field season" which last from October to May, during which all hands are employed in surveying, *i.e.*, in observing angles, and in measurement of distances, and other field or out door duties, and generally in all that is needed to complete the field maps of the country under survey. Office work is at this time limited to that which is necessary for the verification of measurements; 2nd, the "recess season," during which the fair mapping and computations including areas are carried on: the recess season extends from May to October.

During the field season, the establishment is divided into two or more sections; the senior Assistants of the party are placed in direct charge of these sections, which they control; they are often unavoidably detached from the control of the Executive Officer, who may have to supervise work in two or more districts simultaneously, and therefore cannot be near to all. They are often placed so that they must act on their own resources and responsibility, enter into correspondence with Civil Officers and control the Sub-Surveyors squads for the proper working of which they are held responsible. During the recess season the Executive Officer is present to conduct all the duties.

Technical Requirements essential for efficient Service in the Department.—From the sketch of the duties given above, it will be, I hope, apparent that the technical duties of the Officers both in the Senior and Subordinate Divisions are of very special nature, and that candidates must be chosen with special aptitude, and need special

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training. During the 25 years I have served, I have not had one single Native Subordinate under my orders that I consider as fitted to carry on the duties of an Officer of the Junior Branch of the Department, much less then, as fitted, for the Senior Branch, for which latter a special training of a military nature, such as the course of studies at Woolwich or Sandhurst affords, is most desirable. There is, as yet, no Establishment or College, that I have cognizance of in this country, that is capable of affording to Natives a training that would fit them for the duties of an Executive Officer, to which grade they would naturally rise if appointed as Assistant Superintendents of Survey. Up to the present time, the number of Military Officers appointed to the Department has been always largely in excess of Civil Officers, and this must necessarily continue to be the case owing to the technical duties and the oft repeated demands made on the Department for Officers to accompany military and exploring expeditions. The best Assistants that I have had under me have been Europeans educated either in India or in England; those who have had the English training have more energy and higher moral tone than those educated in India, and both, for survey work are decidedly preferable to the Eurasian. Ordinary surveying, provided the special requirements are present, is not difficult to learn, but in no class of work is there a greater necessity for absolute truth and accuracy. A proper survey has but one quality, that of absolute correctness, based on honest true observations, needing a never ceasing amount of care from the beginning to the end of each and every operation. One careless or bad angle may for a time almost paralyse work.

The classes of the community who seek to be employed and capacity of each for rendering efficient service.—All appointments to the Junior Branch are in the hands of the Surveyor-General who selects the best men available and by whom they are allotted to one of the three branches. As a rule all appointments in the lower or subordinate classes are filled by Asiatics (Hindoo and Mussalmen) who are recommended for appointment to the Deputy Surveyor-General in charge of the Branch by the Executive Officers, after serving a probationary period, they are now required to have passed the 4th or Middle School Test; any intelligent Native is usually easily taught the use of Survey instruments, and many become excellent practical Surveyors and adepts at map-drawing, and as long as they can be employed in a groove or given a fixed rule to go by, they perform excellent work, provided also that they know that what they do will be checked and examined; when they feel that check will not likely be instituted, they at once become careless, and probably do dishonest work. The class of men at present seeking employment fail when they meet with any unusual difficulty, and when they have to depart from rule, and act on their own responsibility, and without the accustomed groove. Up to the present, they need the support of a European, and this is why they are still unfitted for the Junior Branch. If Asiatics with the necessary professional acquirements and with an equally strong moral tone as that of the European and with fertility of resource and a mind above practising deception can be found and can be induced to join the Department, I give my full approval to their being appointed to the Junior Branch, but I confess myself as quite unable to even hint as to where such a Native is to be found, but until found, the Asiatic should be kept out of the Junior Branch or the desired standard of excellence will not in my opinion be maintained.

The *President.*

Have you had any well educated Natives among your subordinates?—I have not. I am not able to speak as to them, I can only speak from my experience of those I have had under me, none of whom were highly educated.

You have never had among your subordinates a Native who had passed through the Engineering course at Rurki?—No.

Have you had any Europeans under you who had done so?—I had two. They were Sappers and joined from the Royal Engineers after passing through Rurki College. I think they went through the course prescribed for Subordinates in the Public Works Department. They are both very good men.

Have you had experience of Europeans who were educated at the Hill Schools?—Yes. Many of the Europeans I have had under me were educated at Mussoori School, and they have done very well in the Department. The greater number of the men we have in the Junior Division were educated at the Hill Schools. I think of recent years there have been more applications for service in the Department from men educated in England than there used to be. These applications used to be entirely confined to men educated in India.

What class of men are those you refer to as applying from England?—The class below the gentleman class—the shop-keepers. They come out to India seeking employment. Probably their parents have been in business here. One of the last applications I had was from the owner of a very respectable shop-keeper at Murree. The applicant was a very well educated boy and is doing very well in the Department.

The Hon. Mr. *Quinton.*

Had his father sent him to England for his education?—Yes.

The *President.*

In what respect do you find Natives wanting?—Speaking, of course, only of the class I have had to deal with, I do not think they are trustworthy. My best Native Surveyor is a very good man, but last year I had to detach him on work which I was unable to go down and superintend myself. He got into difficulties at once, which I think all Natives would do. They have not the fertility of resource that Europeans have.

Witness No. IV.—10*th June* 1887.

Examination of J. S. PEMBERTON, Esq., Surveyor, 2nd Grade, Junior Division, Survey of India.

The *President.*

When did you enter the Department?—On the 6th October 1860. I was born in this country of parents domiciled here and was educated in the Doveton College, Calcutta. I entered the Department at the age of seventeen in the lowest grade of Sub-Assistant Surveyor on Rs. 100, and have risen through the different grades to my present appointment.

Have you formed any views on the recruitment and constitution of the Department?—Yes.

The qualifications for efficient service in the various branches of the Department may be briefly and generally stated under the following heads:—

1. A knowledge of Mathematics up to the standard prescribed in the Examination test for candidates for admission to the Senior and Junior Divisions of the Department.

2. Acquaintance with surveying and mathematical instruments and capability of using them with facility.

3. Sufficient skill in drawing generally, and particularly in map-drawing; such are the technical requirements of the Department. But to constitute an efficient Surveyor, and that too in every grade and branch of the Department, an officer should enjoy a healthy physique and be capable of enduring great and protracted hardships and exposure; he should also possess the power of commanding respect and obedience; tact in dealing with Subordinates, especially Natives; aptitude for organizing an establishment and maintaining order among its members, and method in the distribution of work according to the capacity of the several members; self-reliance; fertility of resource under difficulties; moral rectitude, involving especially trustworthiness in matters pertaining to the expenditure of public funds; a colloquial knowledge of the Vernacular, and a conciliatory manner towards the people of the country under Survey operations; and ability to describe in an apt and concise manner the nature of the country under survey, its products, manufactures, people and topographical features.

The classes of the Native community from among which the Department is principally recruited in the Subordinate or Sub-Surveyor grade, are, what may be called the middle class of Native society both Hindu and Mahomedan, *i.e.*, the class which is not sufficiently wealthy to live without the necessity for work and just above the lower orders, who are too poor to pay for education and chiefly engage in either menial service or agricultural pursuits, as field laborers, &c. The members of this middle class are fairly well-educated and intelligent and for the duties required of them are admirably suited to the Department. With few exceptions, they receive their education in Zillah Schools, and many have passed the "Middle School Examination" and possess some slight knowledge of English. In regard to the comparative capacity of Hindus and Mahomedans for rendering efficient service in the Department, I consider the former much better as Computers and Accountants, but the latter bear the palm as Surveyors, Explorers and Draughtsmen.

Have you formed any comparison between Europeans educated in India and those educated in England as regards their work in the Junior Division of the Department?—My experience is that the European or the Eurasian is always more capable of doing what is required of him than the Asiatic.

But as between Europeans educated in this country and Europeans educated in England?—I think they are equally good.

In recruiting the Department which system do you prefer, a competitive examination or qualifying examination followed by nomination?—For appointments to the Junior Division I prefer the latter.

Why do you object to competition?—I do not say that I object to it exactly, but I think it would answer better to have a qualifying examination.

What is your reason for preferring one system to the other?—I consider that the moral and physical qualifications necessary for service in the Department cannot be so well tested by competitors.

Have you anything to suggest as regards promotion from the Junior to the Senior grades?—No.

You would maintain the present system?—Yes.

Have you considered the question of the desirability of largely employing Military Officers in the Department?—No.

Have you anything to say regarding the pension and furlough rules of your Department?—I should like to see our pensions granted on the graded system as in other Departments instead of their being fixed pensions for fixed periods of service.

Have you anything further to add?—I consider that the right to count a certain amount of furlough as service for pension should be conceded to members of the Junior Divisions of the Survey Department as it is to certain privileged members of the Uncovenanted Service (*vide* Section 96, Civil Pension Code).

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Section IV.—Written Evidence.

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No. I.—P. N. BOSE, Esq., Deputy Superintendent, Geological Survey.

I can find no valid reason why Natives of India should have so long been excluded from at least the Junior Division of this Department. Out of 133 officers in this Division, I can find only one Indian name. The ground of physical unfitness is without any foundation. Officers of the Public Works Department have to work quite as hard, if not harder, considering that they have to work throughout the year in all sorts of weather, whereas the Survey officers, as a rule, work in the field for six or seven months only. The ground of moral unfitness is equally baseless. The pay which the Surveyors and Assistant Surveyors get will secure the services of men of average education and integrity, similar to those who form the Subordinate Judicial and Executive Service. I would propose—

1*st*.—That the Junior Division be recruited by open competition.

2*ndly*.—That a certain proportion of the appointments in the Senior Division be reserved for Military Officers, and that the rest be filled up by competitive examination of a nature such as to ensure the entrance of men of sufficiently high Mathematical and Scientific attainments, or by selection from among the graduates of the different Universities.* If the two-third scale of pay be adopted for the non-Military men, considerable saving would be effected.

Military Officers are necessary for the direction of Survey parties accompanying Military expeditions or working in disturbed tracts. But Revenue Surveys certainly, and Topographical Surveys in peaceful parts of the country may, I think, be entrusted to Civil Officers.

Kati Kanta Sen, Esq.

No. II.—KATI KANTA SEN, Esq., Head Master and Manager, Training School, Dehra Dún.

As a Sub-Committee in connection with the Public Service Commission will sit at Lahore and other places in order to ascertain the true state of things in regard to the employment of Natives in certain Departments of the State, it is the duty of every lover of his countrymen to strengthen the hands of the Honorable Members with authentic information, never exaggerating anything which will make the evidence comparatively weak and give a handle to the opponents of Native advancement. I shall therefore give a few of my experiences regarding the Great Trigonometrical Survey for the enlightenment of the Committee, whose calm dignity and real earnestness to find out the truth has inspired the public with great confidence and hope.

The first thing which strikes us, is the entire dependence and utter helplessness of the Natives employed in this office,—being subject to no other rules and regulations except the caprice of their superiors. A graded scale of salaries (*vide* General Walker's order, dated 23rd June 1868), with fixed annual increments, was sanctioned by the Department since the beginning of time, but the wonder is that, though it has uniformly been given effect to in the case of Europeans, it has remained a dead letter so far as the blacks are concerned.

A part of the Computing office goes to Mussoori every year for eight months—a purely selfish arrangement, originating in the anxiety of some of the gentlemen of the office to enjoy the cool climate of the hills. The proposal when first made was opposed by Government on the ground of expense; but the authorities waived their claims to allowance, and even proved that, as both head and hand work was better done in the bracing air of the hills, it would, in the long run, effect an immense saving to the Department. In the face of such arguments, the measure was approved by the Government, but it was an advantage secured wholly at the expense of the Natives, who have thus to keep a separate establishment during a greater part of the year, entailing on them an additional outlay of from Rs. 20 to Rs. 30 a month, which, considering their small income, is a real trial; and as houses are very dear in Mussoori, they are content to live in the damp pigeon-holes below the office-rooms * * the use of which has been * * granted them; while the Europeans who

* The degree of Mathematical and Scientific knowledge necessary for the Survey work can be found among the picked graduates of our Universities. Practical training is, of course, indispensable, and that should be got by serving a period of apprenticeship.

own comfortable houses there, and have a good climate to enjoy, for which they would give anything, are quite at home during the season, * * and suffer no inconvenience.

The Resolution of the Government of India for the employment as junior Surveyors, having equal pay and prospects with the Europeans, is being avoided, and there is little hope it will ever be carried out in future. An examination was held the first year it was published, and several Natives passed very high, but they were not admitted as they proved inferior in free-hand drawing, though no objection was made in the case of the European candidates who showed the same deficiency (probably in a higher degree) and were very poor in the other subjects, especially in Mathematics. Moreover, they were allowed a period of probation to perfect themselves in the art of drawing, a privilege which the Natives, as a rule, do not and cannot enjoy. The following year a notice was issued by the Surveyor-General (Colonel DePree) reducing the scale of salary for Natives to two-thirds that of Europeans, which had the desired effect of discouraging applicants, and no examination has since been held, nor is there any sign that one is likely to be instituted at any time in future. Two men, rather advanced in years and of indifferent education, who went with the Boundary Commission, have been raised to the post of Sub-Surveyor, a master stroke of policy adopted in view of any inquiry being made by the Supreme Government on the subject, and ultimately to prove the experiment a failure. But we want the open competitive examination as sanctioned by the Government of Lord Ripon. * * *

As to the general unfitness of the Natives to hold any but the lowest posts in the service, we are puzzled to think how matters may have grown worse with the progress of education. When it was still in its infancy, we find Natives holding the post of Instrument-maker to the Honorable Company, and that of the Chief Computor of the Surveyor-General's office drawing from 500 to 600 rupees a month; and the mechanical skill of the one, and the field surveys and the literary scientific productions (this refers to the "Survey Manual" compiled by Baboo Radha Nath Shikhdar) are sufficient proofs of their ability. At present the highest pay received by them in the Computing office is Rs. 240. Yet it would appear from General Walker's remarks that they are doing as good, if not better, service now than was ever done by Mr. Shikhdar.

"The two first men on the list of Native Computors,—Baboo Gunga Prasad and Babu Kali Mohan Ghosh—are men of remarkable ability, who have rendered excellent service, the former in the general administration of the Computors, the latter in the investigation of original Mathematical formulæ, which have been employed in the Great Simultaneous Reduction. These men are fully equal, if not superior, in their attainments, to Babu Radha Nath Shikhdar, Colonel Everest's Chief Computor, whose salary was far higher than theirs. And there are several other Computors whose loss to the office, if they were tempted by the offer of higher salaries to leave it, would be very serious." That the Natives should ever be promoted to the senior grade is, under these circumstances, simply out of the question.

The same admission is made in Colonel DePree's Survey notes (Departmental Order, No. 11, dated 9th December 1885), * * * of which extracts are given below to show that it is not lack of ability or fitness on the part of the Natives, but something else that stands in their way:—

"I may here remark incidentally that my numerous late inspections show me that the tendency of the European Surveyors is to stand and look on while the Natives are made to do the drawing and hand-printing, as if they thought themselves quite above that sort of thing. This is a mistake, and it cannot be permitted for the future. Besides it is suicidal for the Europeans to admit that Natives can do any one thing better than themselves. They should claim to be superior in *everything*, and only allow Natives to take a secondary or subordinate part."

"Here I may again remark another mistake which seems to me to have crept in of late. I noticed in one of the monthly reports that a Sub-Surveyor—quite an inferior one too—was employed through the month in computing latitudes and longitudes. Now this work forms perhaps that part which may be termed "scientific," therefore it ought to be done by the best workmen, for on its accuracy the whole work depends. It is contrary to common sense to entrust that work to an inferior paid Native, and only the Europeans, who had shown their knowledge of Mathematics, when examined before admission, and therefore were presumably the most intelligent men in the party, were allowed to take part in the original computation."

"In my old parties I never permitted a Native to touch a theodolite or an original computation, on the principle that the triangulation, or scientific work, was the prerogative of the highly paid European: and this reservation of the scientific work was the only way by which I could keep up a distinction, so as to justify the different figures of pay respectively drawn by the two classes, between the European in office-time, and the Native who ran him so close in all the office duties, as well as in field duties."

"Yet I see that Natives commonly do the computations now adays and the Europeans some other inferior duties."

"In the above remarks I refer to Topographical Parties with scientific work, and not to the purely mechanical computation of traverses. Here Natives must be employed for economy's sake."

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No. III.—BABU PARBATI CHURN ROY, B.A., Deputy Magistrate, Deputy Collector, Munsif, Small Cause Court Judge, and Subordinate Judge, Darjeeling, and late Superintendent, Dearah Surveys and Settlements in Eastern Bengal.

I have had many exceptional opportunities of studying the working of the Survey Department. For several years I was in independent charge of the Surveys of the banks of the big rivers of Eastern Bengal, and I beg to state at some length my opinion regarding this Department from which Natives are at present excluded, except as regards the very lowest of the appointments. As the reasons for such exclusion are given in the statement submitted to the Sub-Committee by Lieutenant-Colonel H. R. Thuillier, R.E., Officiating Surveyor-General of India, I shall in the first place state those reasons and then proceed to examine them one by one. According to the Officiating Surveyor-General, Natives are unfit for holding appointments in the Junior and Senior Divisions of the Survey Department because—

1. The purely scientific work, viz., geodetic, tidal researches, gravity, variation, &c., requires exercise of high mathematical ability, the knowledge of the construction of the instruments employed, and practical familiarity with their management.
2. Topographical and geographical work need artistic and scientific skill, physical endurance, and perseverance.
3. Cadastral surveys entail, besides the skill and labour enumerated above, the supervision of large establishments, and include much of the work formerly performed by the Settlement Department, viz., the preparation of the record of rights, which involves a knowledge of Revenue laws.
4. For the Junior or Subordinate Division, in addition to the professional attainments requisite, moral and physical qualifications are also highly essential, viz., fertility of resource, trustworthiness, aptitude for organizing, power of enforcing orders, endurance and activity.
5. The duties of the Survey Department are many and varied; some of the officers must necessarily be kept for special duties. The remaining officers ought to be so selected that they may be capable of undertaking any work that the Department may be called upon to perform, and the quality of general usefulness is far more likely to be found among Europeans than among Natives:
6. Natives, who receive the required scientific education and possess the qualifications necessary for appointments in the Senior Division are yet to be found.
7. The duties of the Junior or Subordinate Division have hitherto for most part been performed by Europeans and Eurasians educated in India, many of whom have passed the Matriculation at the Indian Universities. The experiment of employing Natives in this branch was tried in past years to a limited extent, but with so little success that it was not continued.

As the Civilian officers of the Senior Division are selected from the Junior Division, and as the civil element in the Senior Division is almost entirely composed of such officers (*vide* the Officiating Surveyor-General's Note referred to above) let us examine at the outset how far it is true that the scientific education and the other necessary qualifications possessed by the officers in the Junior Division on their first admission into the Service are not likely to be found among Natives.

The scientific qualifications required of applicants for the Junior or Subordinate Branch of the Survey Department are as laid down in the "Memorandum of Instructions for Applicants" (Survey Form 0·28), a knowledge of the following subjects :—

Arithmetic	Up to Proportion.
Algebra	Up to Binomial Theorem.
Geometry	First Four and Sixth Books of Euclid with problems.
Mensuration	Areas of Plane figures.
Trigonometry	Up to Solution of Triangles, use of Logarithm tables, Heights and Distances.
Writing and Drawing	Handwriting and Writing from Dictation, Map and Plan-drawing, Free-hand drawing, and Hand-printing or Map-writing.

It will be seen from the above list of subjects that the officers who enter the Survey Department after passing an examination therein do not bring with them "the high mathematical ability, the knowledge of the construction of the instruments employed, and a practical familiarity with their management" which, we are told by the Officiating Surveyor-General, are indispensable for the conduct of "purely scientific work, viz., geodetic, tidal researches, gravity, variation, &c." They are, therefore, left to pick up what knowledge they can of these subjects subsequently to their admission to the Survey Department. But what is most to be wondered at is that the applicants are not even examined in the Elementary Principles of Geodesy, the subject which immediately concerns them in the discharge of their duties as Assistant Surveyors. This, surely, cannot be the best method of recruiting men for "purely scientific work." Now, let us see if there are not Natives who receive a systematic training not only in the subjects in which European and Eurasian

applicants for admission to the Survey Department are examined, but also in Geodesy and other scientific subjects, in which all the knowledge that the latter acquire is acquired through private study after appointment in the Survey Department.

The Sub-Committee are aware that there are Engineering Colleges in Shibpur (Calcutta), Roorkee, Bombay, and Madras. I shall give here an account of the subjects taught in the college at Shibpur. Students are admitted into this college after passing the Matriculation Examination of the Calcutta University. After the under-graduates have studied in the college for three years, they are examined at the First Examination for Engineering in the following subjects :—

I.—Mathematics.

Arithmetic	The whole.
Algebra	To the Binomial theorem (omitting scales of notation) exponential theorems and logarithms.
Geometry	Euclid Books 1, 2, 3, 4 and 6 with deductions.
Conic Sections	Treated geometrically.
Trigonometry	As far as the solution of all cases of plane triangles, DeMoiveri's theorem, exponential values of sine and cosine.
Mensuration	Mensuration of surfaces and solids.
Analytical Geometry	Equations of the straight line, circle, ellipse, hyperbola and parabola without reference to the general equation of the 2nd degree.
Statics	Parallelogram and triangle of forces, resultant of parallel forces, couples, moments, equilibrium of any forces acting on a particle or rigid body, centre of parallel forces, centre of gravity, friction, simple cases of tension of strings, levers, pulleys, wheel and axle, inclined plane, screw.
Dynamics	Definition and measurement of mass, force, velocity, acceleration, momentum, work and energy. Laws of motion, uniform motion, uniformly accelerated motion in a straight line, parabola and circle. Relative motion. Simple cases of impact.

II.—Natural Science.

Chemistry	Inorganic chemistry. The metals and non-metals.
Physics	Light, heat, electricity, magnetism and the elements of telegraphy.

III.—Engineering Construction.

Materials.

IV.—Geodesy.

Use of the scales, prismatic compass, pocket sextant, level, theodolite and plane table, topographical surveys of limited areas, practice of levelling, route surveying and laying out curves, elements of practical astronomy.

V.—Drawing.

1. Free-hand drawing.
2. Projection—(*a*) Orthographic, (*b*) Isometric, (*c*) Perspective.

It is hardly necessary to point out that there can be no comparison between the young men who pass the First Examination in Engineering and those who pass the examination for entering the Survey Department. While the latter's knowledge of mathematics extends up to trigonometry, the former's goes up much higher and the former possess a knowledge of physics, chemistry and geodesy (not to speak of engineering construction) in which the latter are entirely wanting. None will deny that the chances for getting properly qualified persons for promotion from the Junior to the Senior Division of the Survey Department would be greater in the case of persons entering the Junior Division after passing the First Examination in Engineering than they are at present. But should the Survey Department require a still more highly qualified class of Assistant Surveyors, they would find them in the young men who, after passing the First Examination in Engineering, take license in Civil Engineering. They are examined in—

I.—Mathematics.

Differential calculus. Integral calculus. Hydrostatics.

II.—Natural Science.

Geology. Mineralogy. Metallurgy.

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III.—Engineering Construction.

IV.—Drawing.

Engineering and Architectural drawing.

But the initial pay, Rs. 120, which the Survey Department give to their Assistants, would attract even such young men as take honors in Civil Engineering after passing the examination for a license in Civil Engineering or the degree of Bachelor in Civil Engineering. The subjects in which the candidates for honors are examined are—

I.—Mathematics.

Spherical trigonometry as applied to Geodesy.
Descriptive Geometry.

II.—Mechanical Philosophy.

Central forces.
Rotation and oscillation of bodies.
Centrifugal forces.
Motion of fluids.
Geometrical optics.
The elements of astronomy and its application to geodesy.

III. Natural and Experimental Sciences.

Heat with reference to steam and combustion.
Chemistry, as applied to cements and preservation of materials.
Practical application of electrical science.
General principles of geology and mineralogy, and their application to engineering.

IV. Construction.

Practice of building.
Theory and practice of bridge-building, roads and railways.
Hydraulic works.
Equilibrium of structures, theory of machines with special reference to the steam engine.
Principles of design.

V. Geodesy.

Surveying.
Topographical drawing.

Now as the above standard for the Honor Examination in Civil Engineering is as high as the standard for the Final Examination at Cooper's Hill College, the Officiating Surveyor-General's statement that "Natives who receive the required scientific education, and possess the qualifications necessary for appointments in the Senior Division are yet to be found" could not have been made with a knowledge of the kind of scientific education imparted at the Shibpur College.

The Officiating Surveyor-General has further overlooked the distinguished services rendered by Babu Radha Nath Sikdar, Chief Computer under Colonel Everest, and Babu Cally Mohon Ghose, Computer under Major-General Walker. The following mention is made of Babu Radha Nath Sikdar by Surveyor-General Colonel H. L. Thuillier and Lieutenant-Colonel R. Smith in the preface to the 1st Edition of their "Manual of Surveying":—

"In parts III and IV the compilers have been very largely assisted by Babu Radha Nath Sikdar, the distinguished head of the Computing Department of the Great Trigonometrical Survey of India, a gentleman, whose intimate acquaintance with the rigorous forms and mode of procedure adopted on the Great Trigonometrical Survey of India, and great acquirements and knowledge of scientific subject generally, render his aid particularly valuable. The chapters 15 and 17 up to 21 inclusive, and 26 of part III, and the whole of part V are entirely his own, and it would be difficult for the compilers to express with sufficient force the obligations they thus feel under to him, not only for the portion of the work which they desire thus publicly to acknowledge, but for the advice so generally afforded on all subjects connected with his own Department" (Preface, page viii).

It is also to the investigations of Babu Radha Nath Sikdar that the formulæ used in the Great Trigonometrical Survey for determining the Azimuth of the Referring Mark from observations taken to a circumpolar star near the time of its maximum elongation are due, as will appear from the following extract:—

"These formulæ have been investigated by Babu Radha Nath Sikdar, Chief Computer to the Great Trigonometrical Survey, and are applicable to all circumpolar stars, irrespective of the lengths of their North Polar distances and they are now used in all the rigorous computation of the Great Trigonometrical Survey." (Manual of Surveying, 3rd Edition, page 596.)

Though since the retirement of Babu Radha Nath Sikdar the post of Chief Computer is no longer held by a Native, the services rendered by Babu Cally Mohon Ghose in investigating new formulæ whereby the labour of the Computing Department has been materially reduced are thus

noticed by Surveyor-General Major-General Walker, in the "Account of the Operations of the Great Trigonometrical Survey of India":—

"The above check is due to Babu Cally Mohon Ghose of the Computing Office, to whom is also due the idea of introducing logarithmic tabular differences in the calculations of the factors of p and q which enter the geodetic equations as already explained at pages 407 to 410. We are also indebted to his ingenuity for a very valuable check on the solution of the equations between the indeterminate factors, which may be here indicated." (Vol. II, page 422.)

"To Babu Cally Mohon Ghose is due the credit of having suggested the employment of tabular log differences in place of differentials in the present reduction, by which so sensible a saving of labour has resulted." (Vol. VI, page 164.)

"In very elaborate and complicated calculations, such as those which are needed for the reduction of the Great Sections of the Triangulation of India, any modifications of the governing formulæ which may be introduced from time to time with a view to reducing the labour of calculation, without impairing the accuracy of the results or tending to increase the risk of the error, are obviously not only legitimate, but highly desirable * * * *.

"It will be seen from the table that important modifications in the forms of the co-efficients of the unknown quantities in the geometrical equations of conditions were introduced * * * * by an ingenious rearrangement of previous formulæ which was devised by Babu Cally Mohon Ghose of the Computing Office, with a view to more fully utilizing the data to hand in the primary calculations of the latitudes, longitudes and azimuths." (Vol. VII, pp. 272-73.)

When making over charge of the office of Surveyor-General, Major-General Walker left the following remarks regarding Babu Cally Mohon Ghose and others which have since found their way to the columns of the Lahore *Tribune*:—

"The two first men on the list of Native Computers, Babu Gunga Prasad and Babu Cally Mohon Ghose, are men of remarkable ability, who have rendered excellent service, the former in the general administration of the computers, the latter in the general investigation of original mathematical formulæ which have been employed in the Great Simultaneous Reduction. These men are fully equal, if not superior, in their attainments to Babu Radha Nath Sikdar, Colonel Everest's Chief Computer, whose salary was far higher than theirs. And there are several other computers, whose loss to the office, if they are tempted by the offer of higher salaries to leave it, would be very serious." (The *Tribune*, May 4th 1887.)

But the fact that Natives are employed as Professors of Mathematics not only in colleges managed by their countrymen, but in the Government and Missionary Colleges as well, and in that capacity teach the High Standard of Mathematics required of candidates for the B.A. and M.A. degree examinations, is sufficient to disprove the correctness of the Officiating Surveyor-General's statement that they cannot in their knowledge of Mathematics compete with the European and Eurasian Surveyors educated in India of whom all that the Surveyor-General could say was that *many* of them had "passed the Matriculation at the Indian Universities," leaving it thereby to be inferred that there were some European and Eurasian Surveyors who had not even passed that examination.

Having seen in the above that Natives are not unfit for employment in the Survey Department by reason of their intellectual inferiority, I shall next proceed to examine the charge of physical unfitness. In dealing with this question it is necessary in the first place to decide what officers in the Survey Department—whether the European and Eurasian Surveyors and Assistant Surveyors, or the Native Sub-Surveyors—now undergo the greatest amount of physical labour?

The only out-door Survey work that the European or Eurasian Surveyor or Assistant Surveyor performs while in camp is, as will be seen from Thullier's Manual of Surveying, p. 253, "to conduct the survey of the Main circuit, observe the angles, and record them with the distances of the station lines in the Field-book," and test the work of the "Interior Detail-Native Sub-Surveyor." All his other duties during the field season consist in examining and computing the data furnished by the Boundary Surveyors, in protracting the work and in keeping his subordinates under check and control, and they are for the most part performed under canvas. But the case is otherwise with the Native Sub-Surveyor who has nothing else to do but survey from morning till evening every day, except Sunday, during the whole of the field season, extending over from six to seven months in the year. Of whom then is it that the greatest amount of physical endurance and perseverance is required? No right thinking person will, it is hoped, hesitate to admit that it is the Native Sub-Surveyor and not the European Surveyor or Assistant Surveyor that displays the greatest amount of physical endurance and perseverance. That the Native Sub-Surveyors perform their arduous work in a satisfactory manner will appear from the following testimony borne by the Officiating Surveyor-General in the "Statement" submitted to the Sub-Committee:—

"In the lowest division, that of Sub-Surveyors, the services of Natives have been extensively utilized in practical Survey work in the field under European supervision, and the work that has been and is being performed by this class of men under that condition is all that could be wished."

Native Sub-Surveyors doing "practical Survey work in the field" are not then physically unfit for the work of the Survey Department. But it might be urged that though *uneducated* Natives are not unfit *educated* Natives are unfit. As the men serving as Sub-Surveyors belong to the same

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literary castes, which supply educated Natives, there is nothing in the nature of things from which one could make an *à priori* inference as to the physical unfitness of educated Natives, and the burden of proving such unfitness would lie on the party making the assertion. The Officiating Surveyor-General has not, however, made any such assertion. All that he has said is that "the experiment of employing Natives" in the Junior Branch of the service, "was tried in past years to a limited extent, but with so little success that it was not continued."

This failure might have been owing to the circumstance that the Natives appointed to the Junior Branch were found unfit by reason of their want of professional training and not by reason of their want of physical endurance and perseverance. That no prejudice may exist on this point it should be carefully examined as to how far *educated Natives* have shown powers of physical endurance and perseverance in other Departments of the Public Service requiring active out-door work. One of these is the Department of Public Works. A reference to the Civil List will show that though the Executive Engineers under Government are mostly Europeans, some of them are Natives and that the Sub-Engineers, Supervisors and Overseers are mostly Natives. As these Native officers entered service after going through a course of Professional and Scientific training in an Engineering College, it cannot be true that education makes a Native unfit for the active duties of the Surveyor. That educated Natives are capable of performing feats requiring continuous physical endurance and perseverance for months together and involving hardships and privations of the severest nature is exemplified in the case of Babu Sarat Chandra Das, C.I.E., the distinguished Thibetan traveller, who received his education in the Civil Engineering College of Calcutta. It might be urged that instances of such physical courage and endurance as were exhibited by Babu Sarat Chandra Das are rare amongst educated Natives. Government has not, however, tried educated Natives in the Survey Department and it would be unreasonable to say that they were not fit for this Department in consequence of their weak *physique* whilst they had been found fit in another Department of a like nature, namely, the Department of Public Works. It is always possible to prevent weak-bodied persons from entering the Survey Department by requiring candidates to produce good certificates of physical fitness, and it would be absurd to proceed on the assumption that among the entire body of educated Natives numbering by thousands there will not be found some that will come up to the standard that may be fixed for admission to the Survey Department. In the Dearah Survey conducted under me, of which an account will be found below, all my Assistants were students of the Calcutta Civil Engineering College; and though they had to undergo the hardest possible physical labour while surveying the islands situate at the mouth of the Megna, they did not exhibit any symptoms of breaking down. The fact is that, Natives whether educated or uneducated, are better able than Europeans to bear exposure to all kinds of weather by reason of heredity, of constant residence in the country, and of habits as to food, drink and dress, moulded by surroundings acting for ages past.

Having shown in the above that Natives are not unfit for holding appointments in the Survey Department by reason of their intellectual and physical inferiority, I shall next proceed to examine how far they are morally unfit. The moral qualifications on which stress has been laid by the Officiating Surveyor-General are—fertility of resource, trustworthiness, aptitude for organizing, and power of enforcing orders. When Natives are holding the highest Judicial appointments under Government without giving any the slightest grounds for doubting their trustworthiness, it only displays a morbid bias to put forward trustworthiness as one of the qualifications for want of which Natives are excluded from the Survey Department. As regards the other moral qualifications, fertility of resource, aptitude for organizing, and power of enforcing orders, the Native Magistrates and Native Engineers have often, in the course of their duties, to deal with cases requiring the display of such powers. It is not often that a Native has opportunities for such a display of these powers as would receive special notice at the hands of Government. But the accounts of the Bengal Famine of 1873-74 contain the records of works done by Natives under exceptionally difficult circumstances and requiring the exercise of these and other moral qualities in an eminently high degree.

The Minute, dated 31st October 1874, by Sir Richard Temple, Lieutenant-Governor, contains a brief record of the services of officers who served under the Government of Bengal during the Famine Relief of 1874 in Bengal and Behar, and it will appear from it that—

Babu Ram Sunker Sen (North Bhagalpur),
" Bhugwan Chunder Bose (Cutwa, Burdwan),
" Ram Kumar Bose (Culna, Burdwan),
" Ajoodhya Pershad (East Tirhoot),
" Ramakhoy Chatterjea (East Tirhoot), and
" Ishree Pershad (Do.)

performed "most satisfactorily" duties of an "onerous and responsible nature" requiring insight into the realities of everchanging situation, power of causing things to be done at the right moment, tact and perception in appreciating instructions, and readiness of sympathy with the people and, indeed, so well as to deserve being classed with such distinguished members of the Covenanted Civil Service as Mr. (now Honorable) C. P. L. Macaulay, Mr. A. W. Paul, Mr. M. Finucane and others, now holding the posts of Magistrates, Collectors and Judges. As many as 37 Native gentlemen, classed with Mr. H. J. Fasson, Mr. C. W. Bolton and Mr. C. J. O'Donell and several other members of the Civil Service of the same standing, are acknowledged to have shown "a

meritorious degree of zeal, intelligence and practical aptitude" in the discharge of their duties as Relief Circle officers.

Amongst the Executive Engineers and Assistant Engineers employed in relief works the following Native officers are classed with European officers as worthy of commendation for "having laboured with energy and success to provide relief work and to turn relief labour to the best advantage:—

Babu Gopal Chunder Mookerjee,
" Madhab Chundra Roy,
" Khetter Mohon Bose,
" Raj Chunder Ghose,
" Ram Kissen Mookerjee, and
" Prosonno Coomor Duncary.

Many subordinate officers of the Public Works Department are said to have "distinguished themselves by hard work, under difficulties of climate and circumstances." Out of 13 officers whose names are mentioned under this head, six are Natives and seven Europeans.

It is to be hoped that the qualities mentioned in Sir Richard Temple's Minute as having been displayed by Native officers of the Civil and the Public Works Department in the Famine Relief works will be taken into consideration when the question of their fitness for work requiring "fertility of resource, aptitude for organizing, power of enforcing orders, endurance and activity" is discussed.

You have been pleased to inquire as to whether I conducted a Dearah Survey for the Government of Bengal and to what extent, if any, I availed myself of the maps of the Government of India Surveys. In reply, I beg leave to make extracts from the Administration Reports of the Government of Bengal, showing (1) the objects for which the Dearah (alluvial) Survey of the great rivers of Eastern Bengal was undertaken, (2) the manner in which that Survey was conducted first by the Revenue Survey Department of the Government of India Surveys and then by a party of Native Surveyors working under my superintendence.

The object for which the Dearah Survey was undertaken will appear from the following extracts:—

"The other case (of the absence of permanent boundary marks) was on the banks of the united streams of the Ganges and the Brahmaputra, where the great river cuts away and reforms year by year scores upon scores of square miles of land. In former years, as land went into the river the State lost its revenue, but it could claim as public property islands and new lands formed in the river bed. Constant difficulty and litigation used to arise about these islands, and accordingly there was passed in 1847 an Act directing that the banks of these great rivers should be surveyed once in every ten years, so that the public revenue and rights might be secured. The banks of the river Ganges in the Fureedpore and Backergunje Districts were surveyed in 1856-57; and reports were made by the Collector and Commissioner during the year 1873 that a fresh survey of the river bank was due, and that unless such a survey were made the Government rights could not be properly secured." (Bengal Administration Report for 1872-73, paragraph 72.)

"The question of the survey of alluvial lands (Dearah) in the bed of the Ganges was alluded to in last year's Administration Report. The Ganges has been resurveyed as far down as Kooshtea, and it is now desired to take on the survey for 100 miles or so, as far as the island of Dakkin Shabazpore at the mouth of the river * * *. The obliteration of landmarks and recognizable features of the country by the action of the river occasions, moreover, disputes and difficulties between private proprietors as to the identification of the boundaries of their property. The object of the present survey, therefore, is to relay the boundaries on the tracts which have been subject to the action of the river. The Dearah Survey was sanctioned during the year, and operations have commenced with the present season. The preliminary arrangements are being effected by the Revenue authorities, who are erecting boundary marks at the trijunction points of all villages throughout a strip of about three miles on the average on each side of the river, and are thus establishing a base line which will be the basis of the subsequent professional survey proceedings. Adopting this line as their base, the professional party will then proceed to lay down the village boundaries in the tract between the base line and the river, in accordance with the former survey, and will erect boundary marks. The old boundary having been thus ascertained and defined, such new lands as may be found to have formed will be surveyed, but the assessment and settlement of these excess lands will fall again within the province of the Revenue officers, and will be subsequently adjusted." (Bengal Administration Report for 1873-74, paragraphs 28-29.)

How the professional Survey Department failed to fulfil the object held in view by Government will appear from the extract given below:—

"A professional party was in charge, as last year, of the Dearah Surveys of the districts of Fureedpore and Backergunje * * *. It was intended to render this survey of permanent value by extending it inland sufficiently to give it a base line beyond the limits of fluvial action. Unfortunately, however, this base line proved of no use to the Settlement-officer, for whose special purposes the survey was made, so that the very object of the survey was not attained. It was the duty of the professional party, after identifying and securing a safe base line far enough inland

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not to have been subject to fluvial action, to retrace on the ground the map boundaries of villages between that base line and the river as it existed at the time of the previous survey (that is, on the land which had been subject to fluvial action since the previous survey, and had reformed), and to secure certain convenient points of those boundaries on the alluvial lands as near as possible to the margin of the river as shown on the previous survey maps. The Settlement-officer could then, by the aid of these boundary marks, have decided exactly how much land each village had gained by accretion or had lost by deluvion since the last survey was made. He complained, however, that the professional survey work, as actually done, gave him no such assistance. The matter was referred to the Board of Revenue, and a long correspondence ensued between the Revenue and the Professional Departments, the result of which showed that the costly labour and agency of the latter had been unfortunately misapplied." (Bengal Administration Report for 1877-78, paragraphs 24-25.)

The Dearah Survey was then taken out of the hands of the Survey Department and I was entrusted with both the Survey and Settlement works. The following extracts from Government Administration Reports and Resolutions will show how the survey was performed by me :—

"The Dearah Survey in the Dacca Division, for identifying and relaying on the ground the boundaries of villages affected by river action and assessing alluvial accretions continued in charge of the Deputy Collector who has been employed on the work for years past * * *. The cost per square mile was Rs. 43-14-6 against Rs. 39-1-0 in the previous year, the increase being due to rearrangement of establishments. The total cost was, however, considerably below half of what it was when the Professional Department was employed, while there was no falling off in the style of work performed." (Bengal Administration Report for 1879-80, paragraphs 23-24.)

"The Dearah Survey operations extended over a considerable portion of the Megna river, over the entire length of the Dhaleswari, and over a small portion of the Jamuna near its junction with the Pudma at Goalundo. The results were satisfactory * * * *. The excellent plans prepared by the Survey party will be of the greatest utility both to the Collectors of districts and the proprietors of the estates concerned. During the past cold weather the Survey party was employed upon the survey of the Brahmaputra river, and during the present season its operations will be extended to the Jamuna river, and southwards in Backergunje and Noakhally. It has been determined to have a survey made of the new formations in the large estuaries in the south of those districts." (Bengal Administration Report for 1880-81, paragraph 24.)

"Babu Parbati Churn Roy was again in charge of the Dearah Survey Party; an area of 763 square miles was surveyed at a cost of Rs. 22,952 as against 591 miles at a cost of Rs. 26,833 in the previous year. The accuracy and economy of this survey have been repeatedly commended, and have, with the sanction of the Secretary of State, been recently recognized by the grant of a personal allowance of Rs. 100 a month to the Superintendent." (Government Resolution published in the Supplement to the *Calcutta Gazette*, 7th September 1881, paragraph 909.)

"The party first took up the test surveys of the banks of the Jamuna and Brahmaputra rivers, and then the country from Bhairabazar on the Megna to Jamalpore on the Brahmaputra. Subsequently the operations were extended to the Backergunje and Noakholly estuaries. The whole area surveyed was about 2,500 square miles, and the maps compiled by this party are remarkably accurate." (Bengal Administration Report for 1881-82, paragraph 24.)

"The operations of the Dearah Survey Party under Babu Parbutty Churn Roy were extremely successful, especially during the latter portion of the year, in which the survey of the Noakhally and Backergunje estuaries, embracing an area of 2,500 square miles, was completed. The Lieutenant-Governor fully concurs in the praise bestowed by the Commissioner on the Superintendent and his staff in connection with his work." (Government Resolution published in the Supplement to the *Calcutta Gazette*, 25th October 1882, paragraph 1,179.)

"The Dearah Survey operations in Eastern Bengal were continued through the Backergunje and Noakhally estuaries to the Bay of Bengal, and the survey in the upper reaches of the Brahmaputra, extending over a length of nearly 47 miles of country, was completed. The area surveyed during the year (ending 30th September 1882) was 3,002 square miles, 1,124 square miles of which, however, were water. Besides the above, a Cadastral survey was made of 39 estates of recusant proprietors, yielding an annual revenue of Rs. 10,260. The surplus lands discovered by the Survey amounted to 92½ square miles, which will, it is expected, yield nearly Rs. 45,000 revenue. The accuracy of the Dearah Survey during the year was quite up to the high standard previously attained. The total cost of the work was Rs. 33,498 against Rs. 46,009 last year." (Bengal Administration Report for 1882-83, paragraph 177.)

The following extract from the Administration Report for 1882-83 gives a summary of the survey conducted under my superintendence :—

"In the course of the past six years, 1877-78 to 1882-83, the banks of the chief rivers of Eastern Bengal, namely, the Ganges and Megna, with their principal branches down to the Bay of Bengal, the Dhaleshwari, the Brahmaputra and the southern portion of the Jamuna, were surveyed. The total area of the tracts of country surveyed in Dacca, Fureedpore, Backergunje, Tipperah, Noakholly and Mymensing is 5,682·74 square miles, at a total expenditure of Rupees 1,59,430. The cost per square mile of country surveyed has, therefore, been Rs. 28-6-10. This

survey has been made in the same scientific manner as the survey conducted by the Revenue Survey Department, and the accuracy of the work has been tested by connections made with 18 Tower stations of the Great Trigonometrical Survey." (Bengal Administration Report for 1882-83, paragraph 91.)

It will appear from the last of the above extracts that the Dearah Survey of the great rivers of Eastern Bengal was conducted by me in exactly the same scientific manner in which surveys are conducted by the Revenue Survey Department of the Government of India Surveys and that the accuracy of the work was tested by connections made with 18 Tower stations of the Great Trignometrical Survey. The Dearah Survey had been declared by Lieutenant-Colonel J. Macdonald, Officiating Superintendent of Revenue Surveys, at page 9 of the Revenue Survey Report for Bengal and Behar, for 1874-75, to be "a very difficult piece of work," and Colonel D. C. Vanrenen, R.A., Superintendent of Revenue Surveys, at page 12 of the report for the following year, expressed it as his opinion that "this work was certainly more difficult and involved more responsibility on the part of the executive than in the prosecution of a district survey." I was, therefore, very anxious to subject my work to all possible kinds of test. With this view I not only compared my maps with the Revenue Survey maps of the First Survey which were obtainable at the offices of the Collectors of districts, but I also obtained the traverse data of the First Survey from the office of the Surveyor-General in Calcutta. I further obtained from the Superintendent of the Great Trigonometrical Survey at Dehra Dún the triangulation charts of the Eastern Calcutta Longitudinal series and the Brahmaputra series, in order to compare the distance between any two of the Great Trigonometrical Tower stations connected with my survey, as obtained from my calculation papers, with the distance of the same two stations as shown in the triangulation charts. My object in making this comparison was to subject my survey to what is called by Colonel Thuillier at page 349 of his Manual of Surveying (3rd edition) "as the most severe test to which a Revenue Survey can be subjected." How far I have been successful in properly applying this test and in correctly doing the very difficult work entrusted to me will appear from the atlases submitted to the Board of Revenue and the Collectors of districts and from the field books and traverse and azimuth calculation papers filed at the office of the Commissioner of Dacca. The numerous boundary pillars erected along the banks of the Ganges, Brahmaputra, Jamuna, Dhaleshwari and Megna, and their principal branches in the districts of Dacca, Mymensing, Furreedpore, Backergunje, Tipperah, and Noakhally will also furnish means for comparing on the ground the maps prepared by the Survey party working under my superintendence.

In conclusion I beg leave to state that the opportunity I had for conducting a large and difficult survey extending over several hundred miles along the banks of the big rivers of Eastern Bengal was chiefly owing to the kind support of Mr. D. R. Lyall, Collector, and Mr. F. B. Peacock, Commissioner of Dacca, and to the favourable reception of my proposals by Mr. H. L. Dampier, Senior Member of the Board of Revenue, and Sir Ashley Eden, Lieutenant-Governor. Such exceptionally good fortune seldom falls to a Native in any Department of the Public Service. But the experience gained by me in various departments as a Deputy Magistrate, Deputy Collector, Superintendent of Dearah Surveys and Settlements, Special Rate officer in connection with the Bengal Tenancy Act, Special Divisional Settlement officer of Chota Nagpore, Munsif, Small Cause Court Judge, and Subordinate Judge leads me to believe that there are Natives, educated even in India, who will be found competent to hold any appointment under Government, though the number of such Natives is at present *very limited*. The system under which appointments are made by Government or the Heads of Departments without any competitive examination is a most objectionable one, and is not calculated to, always, secure the services of the ablest man available in the country. Governors are not in a position to know the qualifications of candidates and have to depend chiefly on the recommendations of Heads of Departments, who again have to depend on the opinions expressed by their subordinates. Besides, Heads of Departments are, often, not free from race or class bias.

I, therefore, humbly venture to suggest that a Public Service Commission, similar to the Civil Service Commission in England, should be permanently appointed in India, by whom candidates for appointments to all the Departments under Government will be selected after competitive examinations. At these examinations there should be no restrictions as to race or class, but that all Natives and Europeans who produce certificates of health, character and respectability should be allowed to compete. One of the members of the Commission should, for reasons already stated, be a Native. If the present Public Service Commission will leave behind it as successor such a permanent Public Service Commission, it will render lasting good to the country.

PART II.

BOMBAY AND MADRAS.

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Members of the Sub-Committee, Bombay (Poona).

The Hon. J. W. Quinton, C.S., C.S.I.*

The Hon. Khan Bahadur Kazi Shahbudin, C.S.I.

Rao Bahadur Krishnaji Lakshman Nulkar.

J. F. Fernandez, Esq.

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Sir Charles A. Turner, Kt., C.I.E., *President.*

Members of the Sub-Committee, Madras.

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Salem Ramasawmi Mudaliyar, Esq., B.A. B.L.

Khan Bahadur Mohamed Ishaq.

D. S. White, Esq.

H. O'C. Cardozo, Esq., *Departmental Member.*

Sir Charles A. Turner, Kt., C.I.E., *President.*

* Unable to attend.

PROCEEDINGS

OF

THE SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

BOMBAY.

Revenue Survey.

Section I.—Note by the Sub-Committee.

The Revenue Survey Department in the Bombay Presidency is charged not only with the survey of land liable to revenue, waste, and forest, the demarcation of boundaries and the decision of boundary disputes, but also with the assessment of the rates at which revenue is payable on land brought under settlement.

The Departmental member has given a concise history of the Department. It was originally organized in 1836, and, after re-organization in 1847, was placed in 1851 under a Survey Commissioner, Captain (now Sir) George Wingate. On the retirement of that officer, his appointment was not filled up, but in 1863-64 two Survey Commissioners were appointed—one to the charge of the Northern, the other to that of the Southern Division—and in 1881 the Department was again placed under a single Commissioner.

In the Presidency proper there are at present four Survey Divisions, *viz.*, the Poona and Nasik Survey, the Gujarat Survey, the Ratnagiri Survey, and the Southern Mahratta Country Survey. Each of these divisions is under the charge of a Superintendent or Deputy Superintendent according to the number of establishments comprised in the Division.

Subordinate to the Superintendent of Survey, there are an Assistant Settlement Officer and Assistant Superintendents of Survey, the number of Assistant Superintendents varying in each division. The duties of the Assistant Settlement Officer are to supervise the classification of soils performed by a field establishment in his direct charge and also to collect such statistics as to the population and condition of villages, the crops and the soil as may be necessary for the assessment of Revenue rates and the compilation of Settlement reports. The duties of the Assistant Superintendents are to supervise the measurement of the lands and the classification of soils.

The existing staff of the Department consists of the Survey Commissioner, with a salary of R2,500, including a personal allowance of R175; two Superintendents, of whom one receives R1,200, and the other, being a Military officer, R1,427-14-0; two Deputy Superintendents on R760; four Settlement Officers on R710; sixteen Assistant Superintendents of the 1st grade on R660; nine Assistant Superintendents of the 2nd grade on R560; one Assistant Superintendent of the 3rd grade on R455; and four Assistant Superintendents of the 4th grade on R355. There are also four appointments of Probationary Assistant Superintendents on R280; but these appointments are at present vacant, probably because it is deemed inexpedient to increase the staff of a Department of which it is contemplated that the operations will be brought to a close in about seven years. In the Map office there is a Superintendent on R800, a Head Photographer on R300, and a Zincographic Printer on R150.

Of the four Settlement Officers, two are domiciled Europeans and one is a Eurasian, and there are three Eurasians in the 1st grade of Assistant Superintendents. The Zincographic Printer is a domiciled European. With these exceptions all the officers of the Department whose pay amounts to R100, and who are not charged with purely clerical duties, are non-domiciled Europeans.

Surveyors who enter the Department after an examination and classifiers of soils, when employed in charge of small parties and under the supervision of the Superintendent or an Assistant Superintendent, receive salaries of R75, and salaries of R35 are paid to measurers.

The grade of Assistant Superintendent was created at the time of the re-organization of the Department in 1847. On first appointment officers were originally posted on probation to the trade of Supernumerary Assistant; but in 1880 the designation of this grade was changed to that of Probationary or Acting Assistant Superintendent. Before appointment, officers are required to have passed an examination in either Mahratti or Gujarati; and after appointment to qualify for the grade of Assistant Superintendent within a period usually of one year. The Departmental member does not mention whether these qualifications are tested by any departmental examination.

Bombay.
Revenue Survey.
Section I.

In 1854 the grade of Sub-Assistant Superintendent was created with the object, it is stated, of rewarding deserving men of the Sappers and Miners, then employed in the Survey as Overseers and was abolished in 1868. A few of these officers were so appointed, and of other classes there were appointed at different times two Europeans, five Eurasians, a Hindu, a Mahomedan and a Parsi. Of the Eurasians, four are now serving in the Department, one as Settlement Officer and three as Assistant Superintendents of the 1st grade. The Hindu is dead, and the Parsi has retired. The Mahomedan retained his appointment in the Sind Survey up to 1879, and when he retired, the grade was abolished in that Survey also. It is not mentioned whether the Europeans who entered in this grade remain in the Department in a higher grade.

The Departmental member does not state what technical or other qualifications are required for efficient service in the Department; but it is to be inferred from his observations that he considers that integrity is specially required in the supervising officers as well as the technical ability to carry on the operations of survey, to classify soils, and to assess rates of revenue. He observes that the main reason for requiring special integrity in the supervising officers of the Survey is that the Department fixes rates of assessment, which are not only to be collected for the period of the current settlement, but are to form the basis of the land-revenue for all subsequent settlements. He regards this duty as one of greater trust and heavier responsibility than the mere collection of revenue; and he suggests that it was in recognition of the importance of securing officers on whom it could implicitly rely that this Department was exempted from the operation of the rules of 1879. He states that the system adopted in the Department is to work with a lowly-paid Native staff, and to secure the necessary integrity by close supervision exercised by European agency. He maintains that this system has been found to be both economical and effective when properly worked. He allows that it might be possible to secure the required integrity if a more highly-paid Native staff were employed under the supervision of Native Assistant Superintendents; but he expresses his doubt whether it would be secured, and he regards it as still more doubtful whether the employment of Native Assistant Superintendents would not prove more expensive than the maintenance of the existing European staff.

Four witnesses were examined by the Sub-Committee :—

Colonel C. W. Godfrey, B.S.C., Superintendent in charge of the Ratnagiri Survey, stated that he joined the Department in 1864; that originally Natives were tried in the higher grades of the service, but that he had learnt from the Revenue Commissioner's report issued in 1836 that they had failed, and consequently European or Eurasian agency had since been uniformly employed. He considered that Natives are fully qualified to survey, and that some of them can classify soils remarkably well, and would do so, provided that there were supervision; but he regarded them as hardly equal to Europeans as classifiers, and he thought that they would be less trustworthy and more amenable to influences. He stated that when the Sub-Assistant grade was in existence the officers of that grade did very much the same sort of measurement work as the present Assistants; but that, as a rule, they did no classification; and he observed that this branch of work is even now confined to some of the Assistants. He considered that the employment of Natives as Assistants would entail the appointment of more Superintendents, and that as the Department is now constituted, it would be unwise to employ them as Assistant Superintendents, as the work is done where there is no adequate control. He stated that he knew that one Native has been employed in the Survey in Gujarat, but that all branches of work are not entrusted to him. He mentioned that the subordinates of the Department have great opportunities for fraud, and that many prosecutions have been instituted against them. While he admitted that education had advanced in the Presidency, he was of opinion that there has not been much advance in morality. He added that in numerous instances villagers applied that the work might be tested by Europeans, and were perfectly satisfied when this had been done.

Mr. W. M. Fletcher, Superintendent of the Poona and Nasik Survey, stated that he entered the Department in 1865 as Supernumerary Probationer, and rose through the several grades till he was appointed Superintendent in 1879. Mr. Fletcher was of opinion that the office of Assistant Superintendent is one of great responsibility and requires great integrity, and for this reason he expressed his preference for European to Native agency. Putting aside the question of trustworthiness, he considered that Natives can do the work equally well. In speaking of European agency, he explained that he referred to Europeans of some social position; and he added that, although he regarded some Eurasians as trustworthy, he considered them as a class less so than the class of Europeans to whom he had referred. He admitted that he knew many Natives whom he would class with Eurasians in respect of honesty. He was aware that the Taluqdari Settlement Officer in Gujarat is a Parsi. He considered that an Executive Engineer is not exposed to such constant temptations as a Settlement Officer. He admitted that Deputy Collectors are entrusted by Government with the charges of Assistant Collectors, but he maintained that the position of a Deputy Collector is not so independent as that of a directing Survey officer. He again explained that he did not desire to be understood as suggesting that all Eurasians are untrustworthy; that he had contrasted the whole class of Eurasians with a limited portion of another class, namely, the special class of Europeans who now mainly fill the appointments of Assistant Superintendents.

Mr. H. F. Hatch, Assistant Superintendent, the son of a Military officer, and who had been born in India but educated in England, stated that he had learnt something of Surveying in

England, and had been appointed to the Department in 1873. He considered that, so far as regards the technical work of the Survey Department, measuring and classifying, Natives are quite competent to do it. He allowed that he had had no experience of Natives as Assistant Superintendents, but, judging from the reputation borne among the peasantry by Mamlatdars, Deputy Collectors, and Sub-Judges, he thought that Natives would not be reliable in such responsible positions as those of Assistant Settlement Officers. He mentioned that he had been engaged under the Collector in the settlement of Khote tenures; that there were employed at the same time on the same work two other Settlement Officers who were Natives, and that those officers were still engaged in the settlement. He had reason to believe that Natives prefer to have their cases settled by an Englishman rather than by their country-men who might be subject to social influences. He had been told this when he was working with the Native officers whom he had mentioned, and to illustrate the importance of fairness in the assessment of the land-revenue, he added that when conversing with the peasantry in the Konkan, he had been told that the English would not have obtained possession of that tract so easily if it had not been for the exactions to which the people had been subjected by the Revenue officers of the Peishwa.

Rao Bahadur Bhimbhai Kirparam, Personal Assistant to the Director of Agriculture, stated that although the Survey and Settlement Department would be abolished in 1892, there must be a trained agency to continue its work; and he urged that Natives should be trained under the existing European agency, so that they might be able to carry it on. He maintained that well-educated Natives, if trained in the Survey, would be as trustworthy as Europeans.

BOMBAY.
Revenue Survey.

Section II.—Note by the Departmental Member.

Bombay. Rev. Survey. Sec. II.

In handing in to you the accompanying Memorandum, which gives a short history of the organization of the Bombay Revenue Survey Department, and a form duly filled in with the information required, I take the opportunity of making the following statement.

The main reason of requiring special integrity in the supervision exercised by the responsible officers of the Revenue Survey is that the Department fixes rates of assessment which are not only collected at once and for the immediate period of the first settlement, but form the basis of the land revenue for all subsequent settlements. This is obviously a duty of greater trust and heavier responsibility than that of collecting revenue merely on certain set lines. It was probably from an appreciation of this point that Government reserved the appointments in the Revenue Survey, together with those in the Police and some other departments, when several other departments were thrown open to Natives.

Further, it has to be noted that the system of the Bombay Revenue Survey Department is to work with a low-paid Native staff and aim to secure the element of integrity by close supervision exercised by European agency, the proportion being about one European officer to thirty Native subordinates. This system has been found to be both economical and effective when properly worked. It may be possible to secure the required integrity by employing a much higher paid Native Staff supervised by Native Assistant Superintendents although I do not think it probable, but at the same time it is very doubtful whether this plan would not prove to be more expensive than the present one.

MEMORANDUM.

The Bombay Revenue Survey was first organized in 1836 and worked on the original lines in several parts of the Presidency up to 1847, when its reorganization was effected on a more uniform system. This system is in force, more or less modified, at the present time.

The whole Department was placed in 1851 under one Survey Commissioner, Captain (now Sir George) Wingate. On his retirement the appointment was abolished. In 1863-64 two Survey Commissioners were appointed—one in charge of the Northern and the other in that of the Southern Division. On the retirement of Colonel Francis, the Commissioner of the Northern Division, both charges were entrusted to Colonel Anderson. In 1881, the two divisions were abolished and the whole Department was placed under one Survey and Settlement Commissioner for the Presidency proper.

Each branch of the Department is under the charge of a Superintendent or Deputy Superintendent according to the number of establishments comprised in that charge. The grade of Assistant Superintendent has existed from the time of the systematized organization in 1847.

The grade of Supernumerary Assistant Superintendent has had its designation changed since 1880 to that of Probationary (or Acting) Assistant Superintendent. Such officers are required to have passed an examination in either Marathi or Gujarati before being nominated by Government and to qualify for the grade of passed Assistant Superintendent in a period of probation of usually one year.

The grade of a Sub-Assistant Superintendent was created in 1854 and abolished in 1868. The class of persons originally intended to be appointed to it were deserving men of the Sappers and Miners then employed in the Survey as Overseers. A few of these were so appointed, and of other classes were appointed at different times two Europeans (uncovenanted), five Eurasians and three Asiatics (one Mahomedan, one Hindu and one Parsi). Of the Eurasians, four are now serving as Assistant Superintendents; the Hindu is dead and the Parsi has retired; the Mahomedan held his appointment in the Sind Survey up to 1879, and on his retirement the grade was abolished in that Survey also.

Details of the existing organization and constitution of the Department will be found in the form hereto appended.

From the Acting Survey and Settlement Commissioner, to the President, Sub-Committee, Public Service Commission, dated Poona, 5th August 1887, No. 1381.

With reference to your letter, No. 414 S, dated 3rd instant, I have the honor to forward an amended statement showing the grades of the several officers at present serving in this Department.

2. The appointments of Settlement Officer and Deputy Superintendent are not graded and therefore no mention of the grade is made against the officers holding those appointments.

Existing organization and constitution of the Revenue Survey Department in the Bombay Presidency, Proper.

1	2	3		4						
				Number of appointments in each class or grade now held by						
Department.	Total number of gazetted appointments, or of appointments not being purely clerical, of salaries of Rs. 100 and upwards.	Distribution of the gazetted appointments or of other appointments mentioned in column 2 amongst classes and grades with rate of pay attached to each.		(1) Europeans not domiciled in India.	(2) Europeans domiciled in India.	(3) Eurasians.	(4) Natives of India.			
							(a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
			RS. A. P.							
Revenue Survey Proper.	43	1 Survey Commissioner, pay ..	2,325 0 0	1	..	..	..	..	..	..
		Personal allowance.. ..	175 0 0	..	..	..	..	..	..	..
		1 Superintendent at	1,200 0 0	1	..	..	..	..	..	..
		1 Superintendent at	1,427 14 0	1	..	..	..	..	..	..
		2 Deputy Superintendents at	760 0 0	2	..	..	..	..	..	..
		4 Settlement officers at ..	710 0 0	1	2	1	..	..	..	..
		16 Assistant Superintendents of the 1st grade at	660 0 0	13	..	3	..	..	..	..
		9 Assistant Superintendents of the 2nd grade at	560 0 0	9	..	..	..	..	..	..
		1 Assistant Superintendent of the 3rd grade at	455 0 0	1	..	..	..	..	..	..
		4 Assistant Superintendents of the 4th grade at	355 0 0	4	..	..	..	..	..	..
		4 Probationary Assistant Superintendents at	280 0 0	..	..	..	..	..	..	..
Photozinco office.	3	1 Superintendent at	800 0 0	1	..	..	..	..	..	..
		1 Head Photographer ..	300 0 0	1	..	..	..	..	..	..
		1 Zincographic Printer at ..	150 0 0	..	1	..	..	..	..	..

POONA,
5th August 1887.

(Signed) A. S BULKLEY,
Ag. Survey and Settlement Commissioner.

BOMBAY.

Revenue Survey.

Section III.—Sittings at Poona.

Bombay.

Rev. Survey.

Sec. III.

Col. C. W. Godfrey, B.S.C.

Witness No. I.—*29th July* 1887.

Examination of Colonel C. W. GODFREY, B.S.C., Supdt., Ratnagiri Revenue Survey.

The *President.*

I entered the Revenue Survey Department in 1864. I was in the Southern Maratha Revenue Survey and in the Ratnagiri Survey. In this Department we employ Native agency as Measurers, Classifiers of soil and Clerks. Natives are also employed as Surveyors; they qualify by passing an examination. No Native receives in the Ratnagiri Survey, of which I have charge, a salary in excess of Rs. 75, except on the clerical staff.

Subordinate to the Superintendent of the Survey there are an Assistant Settlement officer and Assistant Superintendents of Survey. The number of Assistant Superintendents varies. I have eight. The Assistant Settlement officer has an establishment and collects such statistics as to population and the state of villages, the crops and soil as may be necessary for assessing revenue rates, and for the compilation of the Settlement Report. The duties of the other Assistants are to supervise the measurement of the lands and to classify the soils. There is no rule so far as I know which excludes Natives from the higher grades of the Service. Natives were originally tried in those grades and failed, and European or Eurasian agency has since been uniformly employed. The Revenue Commissioner's report for 1836 mentioned their failure. I have one Native Surveyor who is in charge of a small party of Measurers in the Jhenjira State. I do not think his qualifications such that the full powers of an Assistant could be conferred on him. I think there are certain duties in the discharge of which Natives as Assistants would require more supervision than one Superintendent could give them. As far as technical knowledge goes they are fully qualified to survey. As to classifying soils, I do not think they are equally competent. They do not grasp the subject so well as a European does; they would not be so trustworthy in classifying; they would be more amenable to influences than Europeans. Some of the Natives can classify remarkably well, and so long as they know they do it with a certainty that their work will be tested, they do it well.

The Revenue Survey Department is to be abolished in about seven years. The first operations of the department commenced about 45 years.

The Hon. Khan Bahadur *Kazi Shahbudin.*

There was formerly a grade of Sub-Assistants who were appointed as probationers on Rs. 50 per mensem with a tentage allowance of Rs. 75. When confirmed they received Rs. 285 per mensem, inclusive of Rs. 30 for *batta* and Rs. 75 for tentage. They could rise to Rs. 355 per mensem. There were two Natives in the grade of Sub-Assistants, a Hindu and a Parsi. The Sub-Assistants did very much the same sort of measurement work as the present Assistants. As a rule they did no classification, and indeed this branch of work is even now confined to some of the Assistants. The Sub-Assistant grade was abolished about 1868. Some of the best men were promoted to be Assistants and the others were transferred to the executive service as Deputy Collectors. The original idea was to reward deserving men of the Sappers and Miners employed as Overseers in the Survey.

I have said there was no rule excluding Natives from the Sub-Assistantships, though I only knew two who were so appointed. There were at that time Native Deputy Collectors, Sadr Amins, &c. I dare say there were Natives who might have done surveying work, but there was other work of the Survey which I should have hesitated to entrust to them. I admit that Government has entrusted highly responsible duties, such as that of Executive Engineers, &c., to Natives. I still think it would be unwise to employ Natives as Assistants in the Settlement Survey inasmuch as the work is done where there is no adequate control. There was one Native employed as Assistant in the Survey in Gujarat. He was employed in the Revenue Commissioner's office and was transferred. He did not do all branches of work devolving on the Assistants.

If classification is properly done, the results of independent work will be within the difference recognized as allowable.

Mr. *Nulkar.*

Classifiers receive Rs. 35, Measurers Rs. 35, Surveyors and Classifiers may rise to Rs. 75. There have been a great many prosecutions instituted against subordinates in this Department. The subordinates have great opportunities for fraud. The frequency of successful prosecutions proves the efficiency of the supervising agency. I admit that education has advanced in this Presidency, yet I remain of opinion that there has not been much improvement in morality. Numbers of cases occur in which villagers come to us and ask that the work may be tested by Europeans and are perfectly satisfied when the work has been examined by us. I have nothing more to add at present.

Witness No. II.—29th *July* 1887.

Examination of W. M. FLETCHER, Esq., Superintendent of the Poona and Nasik Revenue Survey.

The *President.*

I entered the Department in 1865 as a Supernumerary Assistant on probation. I have risen through the grades and was appointed Superintendent in 1879. I regard the appointment of Assistant Superintendent as one of great responsibility and requiring great integrity, and for this reason I should prefer European to Native agency. Putting aside the question of trustworthiness I should say the Natives could do the work equally well. When I say European agency, I am referring to Europeans of some social position. I regard some Eurasians as trustworthy, but I consider them as a class less so than the class of Europeans to which I referred.

The Hon. Khan Bahadur *Kazi Shahbudin.*

I should give a preference to the European. I know many Natives whom I should class with the Eurasian in respect of honesty.

The Taluqdari Settlement officer in Gujarat is a Parsi. The Executive Engineer in Kanara may be a Native, but he is not exposed to so constant temptations as a Survey officer.

Mr. *Nulkar.*

The duties of Assistant Collectors require trustworthiness. I am aware that the Deputy Collectors hold those charges. I allow that Government may consider them trustworthy, but that is a matter of opinion.

But let me say the position of the Deputy Collector is by no means so independent as that of a directing Survey officer.

Mr. *Fernandez.*

I certainly do not desire to be understood as suggesting that all Eurasians are untrustworthy. I was comparing a whole class with a limited portion of another class. I contrasted Eurasians with the special class of Europeans who now enjoy the appointments of Assistant Superintendents and there are Eurasians among the present Assistant Superintendents.

Witness No. III.—29th *July* 1887.

Examination of H. F. HATCH, Esq., Assistant Superintendent, Ratnagiri Survey.

H. F. Hatch, Esq.

The *President.*

I joined the Department in 1873. I had learnt some surveying in England. I was born in India. My father was in the Military service of the Crown.

I think that as regards the technical part of the work, measuring and classifying, Natives are quite competent to do it. As regards supervising, I have no experience of Natives as Assistant Superintendents; but, judging from the reputation borne among the peasantry by Mamlatdars, Deputy Collectors, and Sub-Judges. I do not think Natives are reliable in so responsible a position as that of Assistant Settlement officer. I was engaged in the settlement of Khote tenures under the Collector. There were at the time two other Settlement officers who were Natives. They are still engaged in settlement work.

The Hon. Khan Bahadur *Kazi Shahbudin.*

I have reason to believe that the peasantry preferred to have their cases settled by a European rather than by their country-men who might be subject to social influences. They informed me so when I was working alongside the Native officers I have mentioned. I should like to say that during my residence in the district, I have ascertained by conversation with the people that the reason why possession of the Konkan was obtained with so little difficulty was the oppressive exactions to which the peasantry had been subjected by the Revenue officers of the Peishwa.

Witness No. IV.—29th *July* 1887.

Examination of Rao Bahadur BHIMBHAI KIRPARAM, Personal Assistant to the Director of Agriculture.

Rao Bahadur Bhimbhai Kirparam.

The *President.*

I have no practical experience of Revenue Survey, but I served in a Collector's office for ten years and after some years on the gazetted staff. I have held my present appointment for three years. After 1892 the present Department of Revenue Settlement will be abolished, but there must be a trained agency to continue its work. Natives should in my judgment be trained under the existing European agency, so that they may be able to take up the Survey work.

I have no doubt that well-educated Natives if trained in the Survey work will be as trustworthy as Europeans.

PROCEEDINGS

OF

THE SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

SIND.

Survey.

Section I.—Note by the Sub-Committee.

Sind. — Revenue Survey. — Section I.

The Revenue Survey Department in Sind is charged with the same duties as the Department in the Bombay Presidency, and officers are, when occasion requires, transferred from the one to the other.

The staff at present consists of a Superintendent, a Military officer on ₹1,127-14, an Assistant Settlement Officer, and seven Assistant Superintendents, of whom four are in the 1st Grade, one is in the 2nd Grade, one in the 3rd Grade, and one in the 4th Grade. The Assistant Settlement Officer receives a salary of ₹710, and the Assistant Superintendents salaries at the same rate as are enjoyed by officers in the corresponding grades in the Bombay Survey Department.

With the exception of an Assistant Superintendent of the 1st Grade, who is a domiciled European, all the gazetted officers are non-domiciled Europeans.

Existing organization and constitution of the Revenue Survey Department in Sind.

1	2	3	4						
			Number of appointments in each class or grade now held by—						
			1	2	3	4 Natives of India.			
Department.	Total number of gazetted appointments or of appointments not being purely clerical, carrying salaries of ₹100 and upwards.	Distribution of gazetted appointments or of other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	Europeans not domiciled in India.	Europeans domiciled in India.	Eurasians.	(a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
Revenue Survey .	10	1 Superintendent, ₹1,127-14.	1	...	...	...	...	...	...
		1 Assistant Settlement Officer, ₹710.	1	...	...	...	...	...	...
		3 Assistant Superintendents, 1st Grade, ₹660.	2	1	...	...	...	...	...
		2 Assistant Superintendents, 2nd Grade, ₹560.	2	...	...	...	...	...	...
		2 Assistant Superintendents, 3rd Grade, ₹455.	2	...	...	...	...	...	...
		1 Assistant Superintendent, 4th Grade, ₹355.	1	...	...	...	...	...	...

PROCEEDINGS

OF

THE SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

MADRAS.

Revenue Survey.

Section I.—Note by the Sub-Committee.

The Revenue Survey Department in the Madras Presidency is charged only with the duties of survey, the demarcation of boundaries and the decision of boundary disputes under Act XXVIII of 1860. The classification of soils and assessment of Revenue are committed to the Revenue Settlement Department. The gazetted staff consists of eighteen officers; one Superintendent on a salary of ₹1,500; one Deputy Superintendent of the 1st Grade on ₹1,100; four Deputy Superintendents of the 2nd Grade on ₹750—but inasmuch as one of these appointments is at present held by a Military officer who is entitled to his staff allowances, the combined salary received by him is ₹1,200; four First Assistant Superintendents on ₹550; five Second Assistant Superintendents on ₹425; and three Probationary Assistant Superintendents on ₹200. All the gazetted appointments are now held by non-domiciled Europeans.

Of appointments which are not gazetted, thirty-eight carry salaries of ₹100 and upwards. Their distribution is shown in the following table:—

1	2	3	4						
			Number of appointments in each class or grade now held by—						
Department.	Total number of gazetted appointments or of appointments not being purely clerical of salaries of ₹100 and upwards.	Distribution of the gazetted appointments and other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	1 Europeans not domiciled in India.	2 Europeans domiciled in India.	3 Eurasians.	4 Natives of India. (a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
		₹							
Revenue Survey.	38	1 Civil Assistant . 350	...	...	...	1	...	...	1
		8 Sub-Assistants . 250	...	1	2	5	...	...	5
		1 Do. . . 225	...	...	1	...	...	...	...
		3 Do. . . 200	...	...	1	2	...	...	2
		1 Do. . . 175	...	...	1	...	...	...	...
		7 Do. . . 150	...	...	5	2	...	...	2
		5 Do. . . 125	...	...	3	1	1	...	2
		9 Head Surveyors . 100	...	...	6	3	...	...	3
		1 Head Accountant . 100	...	...	...	1	...	...	1
		1 General Storekeeper. 100	...	...	...	1	...	...	1
		1 Map Record-keeper 100	...	...	...	1	...	...	1
			...	1	19	17	1	...	18

According to the sanctioned scheme of establishment, there are three grades of Sub-Assistant Superintendents with salaries, respectively, of ₹250, ₹200 and ₹150, but for many years it has been the practice to give men less than the full sanctioned pay and gradually to increase their salaries to the sanctioned amounts. There is reason to believe that this practice will be discontinued.

It will be seen that these appointments are all held by Statutory Natives, and only one of them by a domiciled European. When the Department was originally created, appointments to the gazetted staff were made by nomination. Subsequently competition was introduced open to all classes of Her Majesty's subjects.

The present senior Deputy Superintendent and three other officers obtained their appointments under the competitive system, but after a few months, on the recall of Sir Charles Trevelyan, it was abandoned and either Military officers or Uncovenanted civilians were appointed on the nomination of the Governor. There is now only one Military officer in the Department. Of late years it has been customary to appoint young men, principally the sons of Civil or Military officers, as Probationers. No technical knowledge is demanded of Probationers before they are appointed, but after they are nominated they are required to go through a course of instruction

Madras.

Revenue Survey.

Section I.

in Surveying and Mathematics at the Civil Engineering College which may extend to one year, and at the end of it to pass an examination in Mathematics and in a Vernacular language. During the course of instruction a Probationer receives a salary of R200. The Departmental member considers that these regulations should be altered, and that candidates for gazetted appointments should be required to pass an examination in Mathematics at the Civil Engineering College before appointment. It will also be seen that some of the witnesses suggest that such candidates should be required to complete their education in Surveying at their own expense and without salaries.

The Survey Department was exempted from the operation of the Secretary of State's order of 1879 prohibiting the appointment of Europeans to posts carrying salaries of R200 and upwards without reference to him, and it has been understood that the exemption applied to the Revenue Survey Department. Hitherto only Europeans have been appointed to the gazetted staff, but in a Resolution, No. 315, dated 22nd March 1887, the Government of Madras declared its intention to appoint Natives and Europeans alternately. As, however, it is contemplated that the survey of the Presidency will be completed and the Department abolished within a few years, and there are at the present time three Probationers to recruit a staff fifteen officers, it is improbable that the Government will be in a position to give any considerable effect to the intention it has announced. The Departmental member has discussed in a note the qualifications of the several classes from whom a selection might be made under the terms of the Resolution: (1) Non-gazetted Survey officers, (2) Officers of other Departments such as Deputy Collectors and Tahsildars, (3) Graduates not in the service, (4) others not in the service. He has arranged them in the order in which he and the senior officers of the Department consulted by him would prefer to take them. At the same time he states that it would not be easy at present to find in the Department men suitable in all respects: for although there are some excellent men among them, those who have been long in office would probably not be able to stand field work and those who have done well in the field are generally wanting in education or social standing. Some good men, he thinks, might be obtained from Deputy Collectors and Tahsildars if they could endure the constant travelling and exposure, but he doubts whether a Deputy Collector would care to take the appointment of Assistant Superintendent of Survey.

He considers that young Graduates, if they were first appointed to the non-gazetted grades of which the duties require a certain amount of field work daily, which could not be done without hard exercise and exposure to the sun for several hours, would be likely in the end to turn out the most useful Native Assistants, as they would commence the out-of-door life while young and before they had contracted sedentary habits. He insists that they should be carefully selected, and suggests that preference should be given to the sons of Native officers of good service. He would require them, before appointment, to pass in Surveying at the Civil Engineering College and, before they were sent up-country, to go through a riding school. He would then appoint them Head Surveyors on R100 a month, and during the first year employ them solely on traverse survey with the theodolite, and he would declare them, after at least two years' service in that grade, eligible for appointment as Assistant Superintendents. He observes that there are at present so many Graduates seeking employment that it would be unnecessary to resort to the 4th class mentioned by him.

Promotion is regulated usually by seniority, but for sufficient reasons officers may receive special advancement or be passed over.

The Superintendent makes all appointments and promotions to posts to which the holders are not gazetted, carrying salaries of R50 and upwards, but on the occasion of vacancies the recommendations of the several Deputy Superintendents in charge of parties are considered. Appointments and promotions to posts carrying salaries of less than R50 are made by Deputy Superintendents in charge of parties. No regulations exist prescribing qualifications for admission to non-gazetted offices except in the case of clerks and computers who are required to possess the educational qualification prescribed for clerical appointments in all public offices. Promotion in the non-gazetted grades is regulated solely by merit.

Officers other than Military are entitled to the benefit of the Leave and Pension Rules prescribed for the Uncovenanted Service.

Mr. Gompertz, Deputy Superintendent of the 1st class, has described the duties discharged by the several officers in conducting survey operations.

The Department is divided into five parties, and to each party a Deputy Superintendent is attached with one or more European Assistants, several Sub-Assistants, and other officers of lower grades. The whole responsibility is on the Deputy Superintendent. The Assistant Superintendent carries out the orders he receives, and is generally in charge of a considerable body of men. The Sub-Assistants are placed in charge of smaller detachments in the field or are retained in the office as Managers. Mr. Gompertz stated that when first he joined the Department the whole of the range work was as a rule done by the superior officers, but that recently men of a much lower class have been trained to do this kind of work; that the main circuit is taken in hand by a specially selected Head Surveyor, and the connection of the Trigonometrical points by the Head Surveyor or a Sub-Assistant; that the observations for azimuth are generally made by a Sub-Assistant, but often by a Head Surveyor; that the village circuits and interior circuits of a village are taken in hand by the Head and Deputy Surveyors; that the Sub-Assistant's duties are principally to inspect the work of his detachment;

that Assistant Superintendents supervise one or more Sub-Assistants, and when empowered under the Act decide boundary cases; and that the Deputy Superintendents have to arrange for the whole conduct of work in the field, and to supervise the staff employed there, as well as a very large office. The present cost of the Madras Survey Mr. Gompertz estimated at R280 a square mile: he attributed the cost to the necessity for the employment of stone for demarcation and to a very minute system of check by field measurements. It will be remembered that during the sitting of the Sub-Committee at Simla, testimony was borne by a superior officer (Major Sandeman) of the Trigonometrical Survey to the excellence of the Madras Surveys.

The description above given of the duties of the several officers of the Department indicates the technical and other qualifications essential for efficient service.

The Departmental member observes that officers must not only be thoroughly good Surveyors, but must have sufficient administrative ability to control large bodies of men and possess sufficient knowledge of Revenue records to settle boundary disputes; that they must be of active habits and able to stand exposure to climate.

He also states that the qualifications for efficient service in the non-gazetted grades vary with the duties on which the men are employed. He mentions that the operations of the Department are divided into five technical sections—

Field work { 1. Demarcation and field measurement,
2. Survey with theodolite and plane-table,

Office work { 1. Computation,
2. Mapping,
3. Publication, *i.e.*, printing maps by photozincography.

He observes that men of the same grade and drawing the same pay may be employed in different sections; that few, if any, men are well qualified for employment in all, though some are qualified for it in two or three sections; and that in the lower grades, the men are, as a rule, qualified for work in one section only.

The Departmental member states that domiciled Europeans and Eurasians have not as yet been tried as gazetted officers, that they are useful as Theodolite Surveyors and for plane-table work in hilly country for which Hindu Surveyors are less adapted, and that for office work generally they are as useful as Hindus. He considers that Natives are useful as Surveyors in the plains and for field demarcation and measurement, and that for demarcation Hindus are generally better qualified than domiciled Europeans or Eurasians, because this work requires acquaintance with Revenue accounts. He states that Hindus are generally employed on account and clerical duties to the exclusion of Europeans and Eurasians, because they can be obtained on smaller salaries, and that a well educated Hindu generally prefers office to field work, while a European or Eurasian often prefers the field. He observes that there are very few Mahomedans who are Surveyors, that they appear to dislike field work, and that in the office they are more often employed as Draftsmen than as Computers or Clerks, the reason being that Draftsmen are exempt from passing the examination prescribed for the clerical staff. He adds that with few exceptions, the Mahomedans who apply for employment are not acquainted with English, and that they are not as quick at figures as Hindus. The Departmental member considers that Village Kurnams could, if instructed and supervised by Survey officers, do the field demarcation and field measurement, but that it would be necessary to relieve them, while so employed, of their ordinary duties.

Five witnesses were produced or presented themselves for examination.

Mr. H. J. C. Gompertz, Deputy Superintendent of the 1st class, stated that, having had some training as an Engineer in England, he came to India and took up an appointment on the Madras Railway which he quitted on obtaining, at a competitive examination, an appointment in the Survey Department. Mr. Gompertz stated that he had not met any Natives whom he considered qualified to be gazetted officers in this Department. He mentioned that he could obtain Matriculates on from R10 to R15 a month who are qualified to do boundary and field demarcation, and boundary survey, men who could rise to the first grade of Sub-Assistants, but who are not sufficiently good to be placed in the supervising grades. In answer to the question whether Natives are unfit and disqualified for employment in these grades, because they are not equal to the charge of large parties, Mr. Gompertz stated that Natives could do such work in a certain way, but that he would lay it down as an axiom that for such work a man educated in England is, and must be, superior to a Native, including in that term a Statutory Native. A very conclusive proof of the superiority of men educated in England is, he thought, furnished by the fact that Europeans who can afford to do so, invariably send their children to Europe for education. He admitted that as an exceptional case a Native might be found who could take command of a party, and that Natives at present take command of considerable parties, but he asserted that they must do so under supervision, and cannot do it independently. He mentioned as an instance a Native Assistant then working in his party. He described him as excellent for certain work, the best Native Assistant he had had, and better than any Eurasian, as having held charge of a very large detachment in Tanjore and also in Madura, and as being a man whom he would not, under circumstances of emergency, hesitate to appoint to act for an Assistant; yet he asserted that it would be necessary that he should work under supervision. He considered that Natives would fail in the supervising grades, because the three requisites

—education, physical capacity, and social standing—are seldom found combined in a Native, and a Native in whom they are found would not enter the Department.

Mr. Gompertz stated that Natives of ability, who have paid for their own technical training, are willing to enter the subordinate grades of the Department, and he mentioned that a young man, a Matriculate, who had qualified in the higher class in the Civil Engineering College and gained a prize at the senior student's examination, had accepted a temporary post on a salary of R40, and he added that there is another B.C.E. in a subordinate grade. He expressed himself as entirely opposed to the system of paying Probationers during the course of instruction, and maintained that these gentlemen should educate themselves at their own expense.

Mr. G. Venkataramaya, Civil Assistant, entered the Department as a volunteer and obtained the post of Gomashta on R10, whence he had worked his way up to the highest post held by a non-gazetted officer. He contended that all future vacancies in the gazetted staff should be reserved for Natives, firstly, because there were at present a sufficient number of European Probationers to fill any vacancies that may occur during the next one or two years, and secondly, because most of the Assistant Superintendents are young men who have only recently joined the Department, and it is unlikely that there will be more than three or four vacancies before the completion of the survey. He recommended that the selection of Native candidates should be made from (1) men of long service and tried ability in the Department, and (2) Graduates of good physique and moral character. He would submit men appointed from the Department to a probation of one year and Graduates to a probation of two years. The Graduates, he thought, should commence as Sub-Assistants on salaries of R125.

He admitted that Hindus hold a fair share of the non-gazetted appointments, but he complained that the full sanctioned pay of an appointment is not given to a man for several years after he has been posted to it and shown his fitness, and he thought that this practice should be altered.

He considered that the demarcation and measurement of revenue fields could be safely entrusted to Kurnams if they were instructed in the work, but they would, he considered, require careful supervision, and he suggested that a Deputy Surveyor should be placed in charge of every ten villages, and a Sub-Assistant in charge of a Taluq. In this way he thought that the work might be done more cheaply than at present and without any sacrifice of accuracy. He considered Kurnams well qualified for such work by reason of the intimate knowledge they possess of the locality and of the Revenue accounts, and that if they are properly supervised, their honesty may be relied on. He stated that he would not himself accept an appointment as Assistant Surveyor, as after twenty-eight years' service in the office, his health would probably give way under the work.

Mr. J. Dring, the senior Sub-Assistant Surveyor, stated that he had served for nine years in the Ordnance Artificer Corps and had, during that period, gone through a course of Surveying and Civil Engineering before he entered the Department; that he obtained his first appointment in 1867 as Acting Head Surveyor on R50; that he had become Acting Sub-Assistant on a salary of R125 in 1871, and that since 1883 he had been drawing R250, the maximum pay of his grade. He claimed that Sub-Assistants should be eligible for promotion to the superior grades, because they had been placed in charge of branch offices and had satisfactorily performed precisely the same duties as those of Assistant Superintendents. He complained that equal salaries are paid to Sub-Assistants, invariably Asiatics, who are retained in the office and to Sub-Assistants in the field; whereas the latter have heavier duties and larger expenses, and are exposed to hardships which the Sub-Assistants at head-quarters escape. He asserted that the latter possess no special qualifications, but had been at the commencement of their service either Draftsmen, Computers, Accountants, or Storekeepers, and that they have only a theoretical knowledge, if any, of field work. He considered that the inequality might be reduced if Eurasians who had served for a considerable time in the field were transferred to office duties, and he declared that if this course had been open to them, many men, whose health had given way in the faithful and zealous discharge of their duties out-of-doors and who had been compelled to retire on a one-third pension, would have been able to continue their service in the office and have earned a higher pension. He urged the abolition of the system of deductions of pay for short outturn, seeing that the Surveyor's salaries are small and that the outturn of work required occasions constant physical strain and frequently results in sickness which entails loss of pay. He pointed out that in the Madras Survey, unlike the Trigonometrical, work is carried on all the year, and that the Surveyors have not the opportunity of spending the unhealthy season in a healthy climate and of thus recruiting their health. He also urged that a similar concession should be made to the Field officers as is made to officers in the Police, *viz.*, a reduction of the period of service required for pension, and he pointed out that these men have to work at times in malarious tracts where they undergo great hardships, and that they are exposed to all kinds of climate. Mr. Dring complained that Military men who had joined the Department, and taken their discharge under an order passed in 1873, are not allowed to count for pension their military service; and that those who had joined since 1873 and remained in the military service, do not receive promotion according to length of service as their comrades do in the Public Works Department, and can therefore get only the lowest military pensions.

Mr. J. Lakshmi Kantha Rao, a Deputy Commissioner of the Revenue Settlement, who

had entered that Department as English Clerk on a salary of R35 and had risen to a gazetted appointment with a salary of R750, stated that, if the Kurnams of the Southern Districts are properly instructed and supervised, their work is as reliable as that of the field Surveyors. He did not think that the Kurnams are, as a class, honest, but he believed that any dishonesty on their part would be easily detected. He stated that in the Revenue Settlement Department the officers who go to the fields and register the ryots' lands are the Classifiers who receive salaries of from R20 to R50. He stated that as Deputy Commissioner of Settlement he had had charge of several parties, each consisting of about 70 men, and that he works under no immediate supervision, but reports directly to the Director of Settlement.

Mr. J. A. D'Cruz, B.C.E., a Sub-Assistant, maintained that, although the Department is exempted from the rules of 1879, the absolute exclusion of Statutory Natives from the gazetted appointments is a violation of the intention of the rules. He maintained that the nominees appointed to the superior grade are practically men of very little education as is shown by the instruction which they are required to receive at the expense of the State—an instruction in subjects which form part only of the Overseer's course; and that it is almost a breach of faith by the establishment of a Government College to induce Natives to provide themselves at their own cost with an education up to an Engineering degree and to supersede them in favor of the uninstructed nominees. He also maintained that the Field Surveyors who have proved themselves competent to conduct the duties of Assistant Superintendents are entitled to promotion, and that by reason of their experience and knowledge of the vernaculars they would possess advantages in which European youths must, for a long time, be wanting. With regard to the physical capacity of Engineering Graduates, he pointed out that these Graduates obtain from Medical officers certificates of physical fitness for the Public Works Department, of which the duties involve no less exposure than the Survey, and he insisted that it is the subordinate staff rather than the superior officers who are most exposed to climate and have to endure the greatest discomforts. He called attention to the paucity of educated men in the Department, and asserted that this is due to the scant recognition of educational qualifications; and he maintained that no persons could become thoroughly competent Surveyors unless they had not only received the practical education which is now all that is required of Probationers, but had been well grounded in scientific knowledge.

MADRAS.

Revenue Survey.

Section II.—Note by the Departmental Member.

Madras Rev. Survey. Sec. II.

Present regulations as to admission to the various grades.—The staff of the Madras Revenue Survey Department is divided into two classes—gazetted officers and non-gazetted officers.

I. *Gazetted Officers.*—The gazetted officers were until lately either Military Officers or Uncovenanted Civilians. There is now only one Military Officer left.

The grades are—

	Pay. R
Superintendent	1,500
Deputy Superintendent, 1st grade	1,100
Do. do., 2nd „	750
Assistant do., 1st „	550
Do. do., 2nd „	425
Probationary Assistant Superintendent	200

First appointments are made on probation by the Madras Government. There is no entrance examination. The nominees are generally sons of officers and have been at good schools in England. Promotion is usually by seniority; but occasionally an officer is promoted out of turn or passed over for special reasons. Probationers have to go through a course of instruction in Surveying and departmental duties. They have to pass an examination in Mathematics and in a vernacular language. Hitherto only Europeans have been appointed, but Government have recently decided, G.O., No. 315, dated 22nd March 1887, to appoint Native officers alternately with Europeans.

II. *Non-Gazetted Officers.*—Non-gazetted officers may be divided into two classes—

(1) Those drawing monthly R50 and upwards to R350.

(2) Those drawing less than R50.

The 1st class, R50, and upwards, are appointed by the Superintendent, or promoted from lower grades on recommendation of the Deputy Superintendents in charge of parties. The 2nd class, below R50, are appointed by the Deputy Superintendents in charge of parties. There is no entrance examination except for Clerks and Computers who have to pass the examination prescribed for the Uncovenanted Civil Service.

Promotion in the non-gazetted grades goes by merit only, not by seniority. The following statement shows the existing organization and constitution of the Department so far as men drawing R100 and upwards are concerned.

Existing organization and constitution of the Madras Revenue Survey Department

1	2	3	4						
Department.	Total number of gazetted appointments or appointments not being purely clerical of salaries of R100 and upwards.	Distribution of the gazetted appointments and other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	Number of appointments in each class or grade now held by—						
			1 Europeans not domiciled in India.	2 Europeans domiciled in India.	3 Eurasians.	4 Natives of India.			
						(a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
Madras Revenue Survey.	Gazetted . 18 Non-gazetted . 38 Total . 56	Superintendent, R1,500.	1	...	...	...	...	...	...
		Deputy Superintendent, 1st grade, R1,100.	1	...	...	...	...	...	...
		Military Deputy Superintendent, 2nd grade, R1,200.	1	...	...	...	...	...	...
		Deputy Superintendent, 2nd grade, R750.	3	...	...	...	...	...	...

1	2	3	4						
Department	Total number of gazetted appointments or appointments not being purely clerical of salaries of Rs. 100 and upwards.	Distribution of the gazetted appointments and other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	Number of appointments in each class or grade now held by—						
			1 Europeans not domiciled in India.	2 Europeans domiciled in India.	3 Eurasians.	4 Natives of India. (a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
Madras Revenue Survey.	Gazetted .. 18 Non-gazetted. 38 Total .. 56	First Assistant Superintendent, Rs. 550.	4	..	..	..	..	..	..
		Second Assistant Superintendent, Rs. 425.	5	..	..	..	..	..	..
		Probationary Assistant Superintendent, Rs. 200.	3	..	..	..	..	..	..
		Civil Assistant, Rs. 350.	..	..	..	1	..	..	1
		Sub-Assistant, Rs. 250.	..	1	2	5	..	..	5
		Do. ,, 225.	..	..	1	..	..	..	..
		Do. ,, 200.	..	..	1	2	..	..	2
		Do. ,, 175.	..	..	1	..	..	..	..
		Do. ,, 150.	..	..	5	2	..	..	2
		Do. ,, 125.	..	..	3	1	1	..	2
		Head Surveyors, Rs. 100.	..	..	6	3	..	..	3
		Central office.							
		Head Accountant, Rs. 100.	..	..	..	1	..	..	1
		General Storekeeper, Rs. 100.	..	..	..	1	..	..	1
		Map Record-keeper, Rs. 100.	..	..	..	1	..	..	1
		Total ..	18	1	19	17	1	..	18

2. *Conditions of service.*—The conditions of service in regard to pay are shown above. Pension and furlough rules are those prescribed for the Uncovenanted Service generally.

3. *Technical and professional attainments essential for efficient service—Gazetted Officers.*—Gazetted officers must not only be thoroughly good Surveyors, but must have sufficient administrative ability to control large bodies of men and must know enough of Revenue accounts to settle boundary disputes. They must be of active habits and able to stand hard work and exposure to the sun.

Non-gazetted Officers.—The qualifications essential for efficient service in the non-gazetted grades vary with the duties on which the men are employed. In addition to ordinary office accounts and clerical work, the operations of the Department are divided into five technical sections.

Field work ... { 1. Demarcation and field measurement.
2. Survey with theodolite and plane table.

Office work .. { 3. Computation.
4. Mapping.
5. Publication, *i.e.*, printing maps by photozincography.

Men in the same grade and drawing the same pay may be employed for the whole of their service in different sections. Very few, if any, of the men are well qualified in all. Some are qualified in two or three. In the lower grades qualification in one section only is the rule.

Village Kurnams could, if instructed and supervised by Survey officers, do the field demarcation and field measurement, but they would probably have to be relieved while so employed from their ordinary duties.

4. *Classes of the community who seek employment and comparative capacity of each for efficient service—A. Europeans not domiciled in India.*—Gazetted officers have hitherto been selected from this class.

B. Domiciled Europeans and Eurasians.—Have not yet been tried as gazetted officers. Are useful as Theodolite Surveyors and for plane table work in hilly country for which Hindu Surveyors are less adapted. For office work generally they are equally useful with Hindus although not so largely employed for reasons stated below.

C. Hindus, Mahomedans and others.—Have not yet been tried as gazetted officers. Are useful as Surveyors on the plains and for field demarcation and measurement. For demarcation, which requires a knowledge of Revenue accounts, Hindu officers are generally more useful than domiciled Europeans or Eurasians. In office, Hindus are, as a rule, employed on account and clerical duties to

the exclusion of Europeans and Eurasians for the reason that qualifications being equal, a Hindu can generally be got for less pay than a European or Eurasian. A well educated Hindu generally prefers office work to field work. A European or Eurasian often prefers the field. There are very few Mahomedan Surveyors. The better class of Mahomedans do not seem to like field work. In office they are more generally employed as Draftsmen than as Computers or Clerks, the reason for this being that Draftsmen are exempted from passing the examination prescribed for Computers or Clerks. With a few exceptions the Mahomedans who apply for employment know very little English and they are not as quick at figures as Hindus.

A large number of Mahomedans of the lower class are employed as Peons.

MADRAS,
5th August 1887.

(Signed) H. O'C. CARDOZO,
Superintendent, Revenue Survey.

FURTHER NOTE ON THE FIRST APPOINTMENT OF EUROPEAN AND NATIVE GAZETTED OFFICERS.

European Officers.—Probationary Assistants now go through a course of instruction in Mathematics at the Civil Engineering College which may extend to one year during which time they are paid 200 rupees a month. This should be changed, and candidates should pass in Mathematics at the Civil Engineering College before appointment. We shall want so few new men during the short time the survey is likely to last that it is not worth while inquiring whether it would be better to admit by competition at home.

Native Officers.—Government have decided to admit Natives to the gazetted grades. In selecting candidates the choice will practically be limited to—

1*st.* Non-Gazetted Survey officers.
2*nd.* Officers of other departments as Deputy Collectors or Tahsildars.
3*rd.* Graduates not in the Service.
4*th.* Other men not in the Service.

I have arranged them in order of preference (*i.e.*, the order in which I should prefer to take them) according to my own opinion and that of the senior officers of the Department whom I have consulted. It would not be easy at present to find men suitable in all respects in the 1st class. We have some excellent office men who would most probably not be able to stand the field work. Educated Natives, especially those who have been long employed in office, dread exposure to the sun, and, as a rule, are not of active habits. We have also some good men in the field but they are generally wanting in education or social standing. The last-mentioned consideration should not be left out of account. Native officers should be gentlemen. The 2nd class, Deputy Collectors and Tahsildars, might possibly produce some good men, but they would probably find the constant travelling and exposure too much for them. It is doubtful whether a Deputy Collector would care to take the appointment of Assistant Superintendent of Survey. I believe that men from the 3rd class, young Graduates, if first appointed to the non-gazetted grades, the duties of which require a daily quantum of field work which cannot be done without hard exercise and exposure to the sun for several hours, will be likely in the end to turn out the most useful Native Assistants. They will begin the out-of-door life while young, and before they have contracted permanent sedentary habits.

They should be carefully selected. Preference should be given to the sons of Native officers of good service. Before appointment they should pass in Surveying at the Civil Engineering College and they should pass through the riding school before being sent up country. They should begin as Head Surveyors on Rs. 100 a month and should be employed solely on Traverse Survey with theodolite during the first year. If they give satisfaction they might then be promoted to Sub-Assistants and after at least two years' approved service in that grade might be considered eligible for promotion to Assistant Superintendent. There are now so many Graduates seeking employment that it would not be necessary to resort to the 4th class, men not in the Service who have not taken a degree.

MADRAS.

Revenue Survey.

Section III.—Sittings at Madras.

Witness No. I.—*8th August* 1887.

Examination of H. J. C. GOMPERTZ, Esq., Deputy Superintendent of the 1st Class.

The *President.*

When did you join the Department?—I entered the Department in 1859. I had previously been working with an Engineer in England, and on my first arrival in this country obtained an appointment on the Madras Railway. I resigned it to take part in the competition of candidates called for by Government for Probationary Assistants in this Service, and I was one of the two selected out of the five who competed.

How long did the system of competition obtain?—Until Sir Charles Trevelyan was recalled, about six or eight months.

Was it open to all classes of Her Majesty's subjects?—Yes.

In what parts of the Presidency have you served?—I have been in every district of the Presidency with the exception of South Kanara, and I have worked in nearly all of them.

Have you worked with Native Assistants?—Not with Native gazetted officers, because none have been appointed.

Have you met any Natives who you thought were fit to be appointed to the superior grades?—No.

Mr. *White.*

What salaries did the Native Sub-Assistants receive?—I have had men under me on Rs. 200.

That is to say, Eurasians and domiciled Europeans?—I mean Natives and Eurasians. I do not think any of them were domiciled Europeans.

The *President.*

Will you kindly describe to us the duties of officers in this Department?—The duties of a Senior Assistant are those of General Manager in a large office, rather than anything else. The duties of Sub-Assistants are generally to take charge of an office or a detachment under a responsible officer. The Department is divided into a certain number of parties, and to each party a Deputy Assistant is attached with one or more European Assistants, several Sub-Assistants and others of lower grades under him. The Assistant Superintendent does just what the Deputy Superintendent tells him; the whole responsibility is on the Deputy Superintendent. As a matter of fact, an Assistant Superintendent is generally in charge of a considerable body of men, but under the Deputy Superintendent, who is alone responsible. The Sub-Assistants are in charge of the office as Managers, and also in charge of smaller detachments in the field.

Who first lays out the work?—The Deputy Superintendent. The duties of officers in this Department are almost entirely those of administration and inspection. The Deputy Superintendent has a very large office, and has also to arrange for the whole conduct of the work in the field; the Assistant Superintendents have, when they have obtained powers under the Boundary Act, the settlement of disputes and all that sort of thing. Under the Assistant Superintendent are generally one or more Sub-Assistants in charge of smaller detachments; all the reports in the first instance pass through them to the Deputy Superintendent.

Who does the actual field work?—When I first came into the Department, the whole of the range work was done by the superior officers as a rule. I was out from daylight to one or two in the afternoon, and thought nothing of riding forty or fifty miles before breakfast; but recently we have trained men of a very much lower class to do this kind of work. The Sub-Assistant is generally employed on inspection; the main circuit is taken in hand by a specially-selected Head Surveyor, and the connection of trigonometrical points is done by the Head Surveyor or Sub-Assistant, and also the taking of observations for azimuth, which is generally done by the Sub-Assistant, but often is done by the Head Surveyor. The village circuits and interior circuits of a village, called Kundams, are taken in hand by the Head Surveyors and Deputy Surveyors.

How far is the work of Sub-Assistants tested by the superior officers?—The work tests itself. I mean to say we have a geometrical test, and a test by bearings deduced from observations of the sun. The Sub-Assistant generally takes these observations, but they are worked in the office, and even if he did work them, he would not be able to check them at all. The theodolite work is done by a different class of men, so that the whole process really tests itself. If there is any error, we have to find out in what part of the field it is, and then we send it out to the field for correction.

Why is your Madras system said to be expensive?—The fields are demarcated by permanent stone, which, of course, is a heavy item of expense, and again we have the most minute system of check by field measurements. It is for Government to decide for itself whether it considers that a lower class of work at a lower cost will answer its purposes. At present, I think the work costs Rs. 280 a square mile. As a rule, I can get any number of Field Surveyors; I get applications from Matriculates, who are willing to take Rs. 10 a month.

To do what kind of work?—They are supposed to be able to do boundary and field demarcation and boundary survey. I have laid down a rule

that I will take no man until he has qualified; and before taking him on, he is examined to see whether he is qualified. I can get any number of educated Natives on from Rs. 10 to 15 a month.

That is not the class of men you would think sufficiently good to put into the supervising grade? —Certainly not. They rise generally to be Head Sub-Assistants, which is the most they can look for as a rule.

We have heard it said in Upper India as an objection to employing Natives in the higher grades of this department, that they are not equal to the charge of large parties?—I have not the least doubt that the work could be done in a certain way by Natives; but I lay it down as an axiom to start with that, for this kind of work, a man educated in England is, and must be, superior to the Native, with whom I include also Statutory Natives; and I think that a very conclusive proof of this is the fact that Europeans in this country who can afford to do so invariably send their children to Europe for education. Why should they do so if they could be turned out as good men by keeping them here? No doubt, Natives can be put in and will do the work in a way, and perhaps, as an exceptional case, you would find a Native quite competent to take the command of a party; but I have never met him. Government, however, have decided that this is to be done.

They take charge of small parties now?—Certainly; they take charge of very considerable parties, but they must be under some one; they cannot do it independently. My present charge consists of No. 5 Party, and is working now in Malabar, which is an entirely new district and where the land-tenure is entirely different. I have also more or less work in Salem, South Arcot, and Coimbatore. I have a Native Sub-Assistant, an excellent man for certain work, the best Sub-Assistant I have had, and better than any of the Eurasians; but I could not send him to Malabar, because in the first place he would most probably resign rather than go, and in the second place he would at once knock up if he did go. This man had a very large detachment in Tanjore under him and also in Madura; in fact, I would not in the least object to giving him the charge of an Assistant at a pinch; but he would have to be supervised.

Mr. *Ramasawmi Mudaliar.*

Is their want of supervising power the only respect in which Natives fail; would there be any objection to trying them as Assistant Superintendents?—We have been told to try them, and, though I am opposed to doing so, I shall certainly let them have a fair trial.

You do not see any reason why they should fail?—I do distinctly see many reasons why they should fail. They have neither the independence of character nor the social standing; that is, some may have social standing, some may have education, and some may have physical capacity, but you will never find these three requisites combined in the same individual; or, if you do find them, you find them in the very men who will not come into this service.

Have you had anything to do with Graduates? —Not much; I have met them occasionally.

So that you cannot judge of their value?—No; but I do not think that a thin veneer of education can obliterate the habits and thoughts of generations.

Mr. *White.*

You attribute great value to an education in England?—If I did not attribute a high value to the education and up-bringing of a child in England I should not be so foolish as to send five there at a cost which is a very considerable tax on my means.

You know Mr. Starr, of course?—Well.

Before he entered this Department, he was in the Ordnance Artificer Establishment?—I think so.

When he joined the Department, was he not ordered to go round to every district and instruct the Surveyors and others in their duties?—Not that I am aware of; he certainly never came for that purpose to any district with which I was connected; and I have never heard that he did so anywhere else.

Mr. Starr did very good work in the Survey?—Excellent work.

In fact, there was no one else that could do the work he used to do?—Oh yes, there were plenty.

He was specially selected for the Head Office?—He was brought in to the Head Office, and gradually rose to the highest place he could rise to there.

The Surveyors who were taken into this Department at about the same time were almost entirely recruited from the Ordnance Artisan class?—No, there were a good number who were, and no doubt there would have been more if we could have got them; but there were a great number of outsiders also.

A Surveyor's work is arduous, is it not?—Yes.

He goes into malarious districts, breaks down with fever, and so on?—Yes.

Considering that Ordnance Artificers and other people in very ordinary walks of life enter the Department, do you repeat what you have stated, that the better class of Eurasians and domiciled Europeans are unfit to enter the higher appointments of the Survey?—Certainly. I have not made any statement here that has not been carefully considered.

From your experience of particular persons, how can you say of the remaining portion of that class, whom you have never seen, that they cannot do this work, that they are not fit to be entrusted with it?—I was asked to state my opinion as to whether it was desirable to promote men actually in the Department, and my answer had reference to the men I have come in contact with.

Those persons belong to the Artificer class?—Not necessarily.

Can you name any one who does not?—Several of them. One is a gentleman, the son of a retired General now in the hills; another is the son of a planter; and there are certainly a good number of others, although I cannot call them to mind at this moment.

And you would not promote such men, not even the son of the General?—I do not know that gentleman personally.

If these higher appointments had been open to them as the Secretary of State ordered and the policy of Government required, do you not think that the Department would now have in it persons

belonging to this class who would be equally as fit as any one else to rise to the highest appointments?—I do not.

Is there any one gazetted officer in the Department at the present moment who is a Native of India or a Statutory Native?—Yes.

Then, holding the opinion you do, how do you account for that?—As I said before, the difficulty is to combine the three requisites, education, physique and social standing; and this seems to have been done in this particular case.

Do you think these combined qualities are utterly absent from a community of about 30,000 souls?—I speak only of my personal experience, which does not enable me to name any man of that class in whom those three qualities are combined.

You have no experience of this class?—Not of the class you name, because, as far as I am concerned, they are non-existent. I say my experience is the almost universal experience of Englishmen in this country.

Had the Superintendents and Assistant Superintendents to pass any test before they were appointed as such, or did they get in by a system of pure patronage?—I had to pass an examination; my friend, Mr. Cardozo, has passed several for the Army, Survey and P.W.D., and I know that three officers entered by the same door as I did, that is, by open competition. Then, again, numbers entered in various ways; a number of military officers were put in, from my point of view rather unfairly, and also a number of civilians, that is, non-military men.

By a system of patronage?—Yes, by a system of selection tempered by jobbery.

Considering that the higher grades of this Department have been largely filled, as you say, by a system of selection tempered by jobbery, do you think that any man of intellect—a distinguished student of the Engineering College, for instance, who has paid a considerable sum of money for his education—would enter a Department in which he would be a subordinate for ever, and be put on a level with the class of Artificers?—Decidedly he would. I have at present a senior man from the Engineering College, whom I consider to be a man of very considerable ability, and he has just accepted a temporary post on Rs. 40 a month. He gained a prize at the examination for senior students, and judging from his paper work—I was myself an Examiner—he is a first-rate man. He has also passed the Matriculation examination. There is another man in the subordinate grades who is a B.C.E.

Do you think that when men of this calibre are coming into the Department, there is any necessity for Government to pay Rs. 100 or Rs. 200 a month for a few European students who are the sons of gentlemen, to pass an examination which is only calculated to test an education of the most elementary character?—We need hardly discuss that question, because I am entirely opposed to the system of paying students at all, irrespectively of other considerations. Mr. Cardozo has himself suggested that these men should educate themselves, and I entirely agree with him.

Witness No. II.—*8th August* 1887.

Examination of G. VENKATARAMAYA, Esq., Civil Assistant, Madras Revenue Survey.

G. Venkataramaya, Esq.

The *President*.

In what capacity did you enter the Department?—I entered the Department as a volunteer. My first regular appointment was as Gumastah on Rs. 10. I am now getting Rs. 350. I have set forth my views in a note which I will read (*reads*).

I am Civil Assistant in the Madras Revenue Survey Department. I entered the Department in 1859 on a very small salary and gradually rose to my present appointment. I served more than 20 years in the District Survey offices. I have never been employed in the field, but I possess a theoretical knowledge of field work.

Gazetted Officers.—Gazetted appointments in the Department have hitherto been conferred exclusively on Europeans, but recently the Local Government decided that in future every alternate vacancy should be given to a Native. I would, however, reserve all future vacancies to Natives only for the following reasons:—

1st.—There are at present a sufficient number of European Probationers to fill up vacancies that may occur during the next one or two years.

2nd.—Most, if not all the Assistant Superintendents now in the Department are young and have only recently joined the Department. It is not likely therefore that more than three or four vacancies will occur during the seven or eight years within which the Survey of the Presidency is expected to be finished. Selection should be made from the following two classes:—

1st.—Men of long service and tried ability in the Department.

2nd.—Graduates of strong physique and good moral character.

Men in the Department should be appointed on one year's probation and confirmed if they give satisfaction.

Graduates should be appointed on probation for two years. They should start with Rs. 125 per month as Sub-Assistants.

Non-gazetted officers—pay, Rs. 100 and upwards.—In these appointments Hindus have a fair share, but in many cases the full sanctioned pay of the appointment is not given for several years after they have shown their fitness for the post. This practice should be discontinued.

Extent to which demarcation and measurement of Revenue fields can be entrusted to Kurnams.—The demarcation and measurement of Revenue fields can be safely entrusted to Kurnams after instructing them in the work. They should be under the careful supervision of Survey subordinates, say, one Sub-Assistant to each taluq and one Deputy Surveyor for every ten villages. The work will be done more cheaply than at present, and there is no fear of loss of accuracy. From the intimate knowledge which the Kurnams possess

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of the locality and accounts, they are well fitted for carrying out field demarcation and measurement.

They can be paid at a fixed rate for the work done by them.

Do you consider the Kurnams honest?—If properly supervised, I think they may be relied on.

Mr. *White.*

Would you accept the appointment of an Assistant Surveyor?—No. After being twenty-eight years in the office, my health would probably give way under the work.

The *President.*

Have you anything further to add?—No.

Witness No. III.—*8th August* 1887.

J. Dring, Esq.

Examination of J. DRING, Esq., Sub-Assistant Surveyor.

The witness put in the following note:—

I am a Senior Sub-Assistant in the Madras Survey. Before joining this Department I served nine years in the Ordnance Artificer Corps, during which time I went through a course of Surveying and Civil Engineering. I entered the Survey to better my prospects, as promotion was slow in the Artificer Corps. I started in 1867 as Acting Head Surveyor on Rs. 50, became in 1871 Acting Sub-Assistant on Rs. 125, and have been drawing Rs. 250, the maximum pay of my grade, since 1883. During my service I have worked in no less than ten districts under several officers.

We have in the Survey Department the superior and subordinate grades. The appointments in the superior grade are all held by Europeans. Hitherto Natives of India have not been appointed to the superior grade. Sub-Assistants are placed in charge of branch offices, and have satisfactorily carried out duties precisely the same as those of the Assistant Superintendents.

The Sub-Assistants in the field have a great grievance in the matter of salary, which is Rs. 250 as the maximum. Sub-Assistants attached to headquarter offices at one time drew no more than Rs. 150, which was raised to Rs. 250 if they went out in the field, but while they now draw the maximum salary without the expense of travelling and keeping up separate establishments, those out in the field have not derived any benefit. In other words, the Sub-Assistant out in the field with heavier duties, exposure to hardships and enhanced expenditure, draws a much smaller salary than the Sub-Assistant (who is invariably a pure Asiatic) of the same grade in Headquarters. It must also be considered that office Sub-Assistants possess no special qualifications, and were at the early stage of their service, either Draftsmen, Computors, Accountants or Storekeepers, and have a theoretical knowledge only, if any, of the duties in the field. A change in the right direction might well be made here in bringing into office those Eurasian Sub-Assistants who have borne the burden and heat of the day. This partiality has led Sub-Assistants with shattered health to retire on the one-third pension, whereas a transfer from out-door to office work would have enabled them to retire on the higher pension, and recruit their health broken down in faithfully and zealously discharging their duties.

Considering that Surveyors' salaries are small, I would plead in favour of the abolition of the system of stoppages for short out-turn. The present out-turn of work expected from each Surveyor is such as to occasion a constant physical strain, and consequently a frequent break-down of health and loss of pay. It must also be considered that the Madras Surveyor, unlike those of other Surveys, has to work out in the field the whole year round, and has no such privilege as spending the unhealthy season in a healthy locality, and thus recruiting his strength annually.

An important and similar concession might with justice be made to field hands as is, I believe, done in the Police and Telegraph Departments. I mean a reduction of the period of service counting towards pension. It must be remembered that we are often out in malarious tracts, undergoing the greatest hardships and exposed to all kinds of weather.

The case of the Ordnance Artificers who entered this Department is very hard. Government ruled in 1873 that Soldiers should obtain their discharge within a stated time to enable them to get their pension from the Civil Department. Those Artificers who took advantage of this order now find that the Military service they had previous to joining the Survey Department does not count towards pension. This is a hardship when such service was continuous and under the same Government, and there was no alternative but to remain in the Civil Department, as most of the men had above 15 years' Military service and had been absent from the corps for at least six years, and to go back only meant that they would have to commence again, with some of their juniors above them. Again, the case of those who joined since 1873 is far worse. After their services were placed at the disposal of the Civil Department no steps have been taken by the Heads of the respective Departments either to allow those who obtained their discharge to count their whole Military service, or those who still remained in the Military service to hold Military rank according to length of service, as is the case with their comrades in the Public Works Department. The consequence is that, although a man may rise in the Survey Department to the grade of Senior Sub-Assistant on Rs. 250, he can only expect his lowest Military pension, Rs. 16-10-8.

The *President.*

If you continue in the service what will be your pension?—Half pension after twenty-five years. I have still five years to put in.

Mr. *White.*

I suppose in the course of your survey work you have had to undergo considerable hardship?—Yes; terrible hardships.

Mr. *Cardozo.*

You will be entitled to half pension before you are fifty-five?—Yes.

Witness No. IV.—*8th August* 1887.

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Dewan Bahadur J. Lakshmi Kantha Rao.

Examination of Dewan Bahadur J. LAKSHMI KANTHA RAO, Depy. Comr. of Revenue Settlement.

Mr. *Cardozo.*

Are not the present class of people we get as Field Surveyors exactly the same as your Village Kurnams in the south?—The Kurnams may perhaps be inferior, because they may not know measurements.

They have no time perhaps to learn?—No, because of their Revenue duties.

And if relieved of their Revenue duties?—They would have time.

Of course their work would have to be checked by Survey officers?—Yes.

From your experience would Kurnams' work be as reliable as that of Field Surveyors?—Oh yes, they were properly supervised.

The *President.*

Are the Kurnams as a class honest?—I do not think so, but any dishonesty on their part would be easily detected.

Who makes the registers?—The Classifier; he goes into the fields and registers the ryots' lands.

Are they men of better education than the Kurnams?—Much better. They get Rs. 20 to 24 and they can rise to Rs. 30, or even Rs. 50 if they are very good men.

Have you been in all parts of the Presidency?—My clerical work has been mostly in the Central office here. I am now in charge of a district in South Arcot.

Are the Kurnams in South Arcot pretty well educated?—They can do their work. They are chiefly hereditary Kurnams, but sometimes private Gumastas are employed.

Are Natives of the country fit to take charge of field parties?—Yes. I have had charge of several parties.

Of how many men?—About seventy.

You have no immediate supervision over you?—No. I submit all my proposals for the settlement of the district to the Director. I am getting Rs. 750. I have been more than twenty-five years in the Department, which I entered as English clerk on Rs. 35.

When were you first entrusted with settlement duty?—In 1862.

And you then learned to classify soils?—Yes.

Witness No. V.—*8th August* 1887.

J. A. D'Cruz, Esq.

Examination of J. A. D'CRUZ, Esq., B.C.E., Sub-Assistant.

The *President.*

When did you enter the Department?—I joined the Department two years ago. I am getting Rs. 125 now. I passed through the Engineering College here. I have set out my views on the subject of this inquiry in writing (Witness handed in the following note:)

The first point on which I have to proffer evidence is the present regulations regarding admission to the various grades of the Department.

So far as I am aware, I believe the Survey Department is one of those that have been exempted from the operation of that order of the Secretary of State prohibiting the employment of Europeans in the Uncovenanted Service on salaries above Rs. 200. The reason of this exemption, I believe, was that Natives of India generally were supposed to be wanting in professional qualifications. The exemption, however, did not preclude the employment of Statutory Natives where the required qualifications were found to exist; nor did it mean that the European was to be given preference over the duly qualified Native where one was forthcoming. The action of the authorities on the above order, however, has been to take advantage of the loop-hole of exemption in case of Europeans, and, in consequence, to close the superior grades entirely to Statutory Natives even when duly qualified. What I state is borne out by the fact that the sons or relatives of European officials of influence have invariably been appointed to the superior grades, and the claims of Statutory Natives duly qualified persistently neglected. I have no reason to doubt that there have been cases where Natives duly qualified as Assistant Civil Engineers and Bachelors of Civil Engineering have applied and have not been successful in obtaining appointments in the superior grades. I am sure that others have been deterred from applying from the exclusive action of Government in selecting Europeans.

The method of selection for appointments in the superior grades can briefly be summed up in one word—"patronage." There is no defined standard of general or professional education insisted upon for admission. This is patent from the fact that almost all the Civil officers of the Department hitherto entertained are gentlemen who have not passed any educational test, and who do not possess credentials of any kind of a general or professional education qualifying them for admission into the Department.

The Department seems to have recognised this fact in the omission of the column "Tests passed by each officer" in the gradation list of gazetted officers, which entry duly finds a place in the gradation list of Sub-Assistants and Head Surveyors. Another piece of adverse evidence regarding the educational standard of the young gentlemen entertained is the action of Government in the institution of a course in the elements of Arithmetic, Algebra, Geometry and Plane Trigonometry that Probationary Assistant Superintendents have to undergo and pass in in the Civil Engineering College, Madras.

That a course, which is but a branch of the Overseer's curriculum, and which even falls short of what is required of Overseers in that particular branch, should have been found necessary, does

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not argue the pre-existence of much elementary education in the candidates appointed. These officers are actually sent to school in the Civil Engineering College for a year or two at a monthly cost to Government of Rs. 100 for each officer.

As patronage and fair competition (either in case of Europeans alone or with Natives) in the selection of officers cannot co-exist, it is evident that Government have put competition out of the question, inasmuch as vacancies in the superior grades are not even advertised. The first intimation that the public get of such vacancies is the appointment in the Gazette making a new draft from the ranks of the sons of European gentlemen.

There are Statutory Natives available who possess the highest professional diploma and degree attainable in India. I allude to the A.C.Es. and B.C.Es. I believe there are even now some unemployed, and others who, from want of better encouragement, have had to take up appointments in the Overseers' grade of the Public Works Department. The above-mentioned men will only be too glad to accept gazetted appointments in the Survey.

There seems a breach of faith with them in establishing a college and in prescribing a test of qualification for the superior grades, in duly appointing Examiners, in conducting an examination, in entailing considerable expense to candidates and the public Exchequer, and then telling them:- "We have not guaranteed you appointments as Assistant Engineers. You are wanting in experience, young Cooper's Hill men must be provided for, or the son of some European official of influence favored and you must be content to take up Third-grade Overseers' appointments." I am forced to say it in the interests of the cause at stake, that in the subordinate grades there are to be found Statutory Natives who possess credentials of the highest general and professional qualifications attainable in India. These men have gone through the departmental practical course prescribed for Assistant Superintendents, and they only solicit a trial in the superior grades. They have paid from their own pockets for a most expensive education in the hope of being better provided than they are in the public service. They have qualified for the superior grades of the Public Works Department and it will therefore be giving them not more than is due in appointing them to the superior grades of the Survey, and Government, by employing them, while acting in accordance with the Secretary of State's injunctions regarding the reservation of Uncovenanted appointments for Natives of the soil, will also man the superior grades with men whose education, general and professional, is guaranteed at no cost to Government.

There is another class of men in the subordinate grades whom it will be an act of well-directed sympathy to remunerate with well-paid appointments. These men are those who have risen from the ranks to the highest appointments in the subordinate grades. I mean those field hands who have conducted and are conducting the duties of the Assistant Superintendents, who are as well acquainted with the details of field work as with office routine. I do not say that these men are educated enough to improve the tone of the Department, but they have been entrusted with and have shown themselves perfectly competent to conduct the routine of business both in the field and in office.

These men are besides, from their long experience in the Department, better able to form a due estimate of the work of subordinates, and to allow for the difficulties and drawbacks their work is subject to, than youthful Europeans who have neither education nor experience to speak of in their favor and who have necessarily to delegate the supervision of work, both in the field and in office, to small-paid subordinates and clerks, and who have further the drawback of not being thoroughly conversant with the vernaculars for a long time after they are admitted into the Department.

The A.C.Es. and B.C.Es. are men who are certified to by commissioned Medical Officers to be fit physically for the ordinary out-door duties of the Public Works Department. The superior grades of the Survey require no special physical qualifications other than those required for the Public Works Department.

The physical endurance required in the superior grades is as nothing when compared with what is required in the subordinate grades. The old field Sub-Assistants of the Survey, if they are now present, will, by their appearance and worn frames, give flesh and blood testimony of that grinding work and hard life that fell to their lot in the subordinate grades.

In the absence of such testimony there is yet another source of evidence which must dismiss all mere opinion on the matter and substantiate the fact that if there is much physical endurance required in the Survey, it is in the subordinate and not in the superior grades—it is the work reports of subordinates and the diaries of superiors.

The Committee have simply to call for the work reports of upper subordinates and the diaries of officers for any month to realise at a glance the truth of my statement.

Quoting the *Madras Mail*, the advocate of European interests and the mouthpiece of European public opinion, "if then, Natives of India do not break down when the lowness of their salaries necessitates their leading a hard and comfortless life, they will assuredly be found not physically wanting when they have tents to live in, instead of being obliged to camp in a palmyra hut or to sleep on a pyal, when they can drive or ride instead of being obliged to walk their marches, and when their means allow of providing themselves with the food and luxuries they are accustomed to in place of a chance meal begged from the village Munsif, or cooked by themselves or their peons."

The first drafts into the Subordinate grades in the olden days of the Survey, I believe, were made from the Survey Class of the Eurasian Artificers of the Gun Carriage Factory. Subsequently, Natives (I mean pure Asiatics) were taken in and departmentally instructed in survey work. At present both Eurasians and Natives are admitted.

The educational standard of the subordinate grades is by no means high.

The gradation list of Sub-Assistants, Head Surveyors and others drawing Rs. 50 and above shows that among 115 subordinates, including Civil Assistants, Field and Office Sub-Assistants, Head Surveyors, Deputy Surveyors on Rs. 50 and above, Head Accountants, Head Computors and Head Draftsmen and Head Clerks, there are nine Matriculates, one First in Arts man and one Graduate. There are, in the whole list, three who have passed the Surveyors' Tests, and one has passed the Assistant Civil Engineer's test and is also a Bachelor of Civil Engineering. There are, I believe, not many Graduates in the Survey offices as clerks.

While the other Departments of Government are manned by Graduates and Natives of some educational standard, it is to be regretted that the Survey has so few of them.

The reasons are not far to seek and can briefly be summarised in the following observations which are based on facts :—

(1) That there have been Graduates who have joined the Department and left it from want of sufficient encouragement.

(2) That education is not given that preferential encouragement that is necessary to induce educated men to join.

(3) That it follows, as a natural consequence of the present constitution of the superior grades, that there is a want of sympathy between the superior grades as at present constituted and educated men in the subordinate grades.

Educated men are subject, in the subordinate grades, to a system of task work and are likely to be paid in common with the uneducated for halves and quarters of days, and they cannot but be alive to the fact that their condition is not one of service but one of slavery, and they feel a moral repugnance to this system that prevails in the subordinate grades. This system can only have found favor to meet the propensities of subordinates who have not the intellectual and moral qualities to realise the obligation of duty to its fullest extent.

The physical endurance of subordinates is taxed to its utmost, and its amount is measured only by the emulation of the interested zeal of subordinates and the equally interested demand of superiors for more work.

The educated men find less work for brain than for muscle in the subordinate grades. There is the want of that judicious distribution of work which enables each man to show himself at his best in his proper qualifications.

The men who join the lower ranks of the service are in a great many instances those who have passed no tests, and who have no hopes in life and who make the Survey a sort of *dernier resort*.

Usually men in the subordinate and superior grades go through a purely practical departmental course in Surveying without the all-important foundation of a scientific knowledge.

A Department that has to do with the purely professional subjects of Surveying, Computations and Drawing should seek men of guaranteed professional qualifications and not employ anybody and everybody. The contradiction of this fact means the repudiation of all science.

In the field there can be no two opinions that Eurasians and Sudras are most capable, inasmuch as they possess in common with other classes the advantages of being bred and born in the country and inured to the climate, and have the further advantage of being flesh-eating classes.

Brahmans, as a rule, if of any education, take to the easier in-door work of clerks.

The higher office appointments in the subordinate grades should necessarily be reserved for men who are able to estimate field as well as office work and who combine the experience of both departments of work. These men should also be men with credentials of professional and general ability.

Before concluding my evidence, I should like to bring to the notice of this Committee the recent action of Government in the appointment of another European, mentioned in last week's Gazette, to the superior grade of the Survey.

The *President*.

When you say you have no doubt that Natives duly qualified as Assistant Engineers have applied for employment in this Department, do you personally know that there have been such cases ?—I believe some have applied of those who passed out of the College this year.

You say there have been Graduates who joined the Department in the subordinate grades and left for want of sufficient encouragement ?—Yes (names one). He told me that the Department did not suit him at all, and that there was not sufficient encouragement in it. He said the pay was not sufficient.

Mr. *Cardozo*.

You have already been on sick leave in your two years of service ?—Yes. I had an attack of malarial fever and have been for four months on leave.

Under how many Deputy Superintendents have you served ?—Under five.

Did any of them recommend you for promotion ?—I do not know.

You say it has come to your notice that Assistant Superintendents are in the habit of delegating their work to clerks. Will you give us one or two instances of this ?—There are some duties that clerks do, which I thought were the proper duty of officers.

Is that the result of your experience ?—Yes.

How has it come to your knowledge that they have done so ?—I have known cases of boundary disputes, settlements of rights and the value of land decided, as I thought, by subordinate officers when I considered it was the proper work of the Assistant Superintendents to determine them.

Do you mean to say that the settlement of right and the value of land was determined by subordinate officers ?—Yes.

Where did this take place ?—In South Arcot. I was in charge of a demarcation party at the time, and the land complaints were disposed of by Deputy Surveyors on Rs. 20.

Did they give the final endorsements ?—No.

They only wrote the reports on which the officer passed the endorsements ?—Yes.

What extent of land was involved in these disputes ?—I do not know.

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Were they disputes between the Government and proprietary villagers?—They were field disputes.

Boundary disputes?—No.

You say that Brahmans are not able to do field work so well as Eurasians and Sudras?—I say that if Brahmans have any education they generally take to office work. The Brahmans we have in the field are quite ignorant of English.

APPENDIX A

TO

MADRAS REVENUE SURVEY.

Telegram dated 24th November 1887.

From the Secretary to the Public Service Commission,—to the Secretary to the Board of Revenue, Madras.

Kindly send list of staff of Settlement Department drawing monthly salaries over one hundred rupees, showing nationalities, and invite Third Member of the Board of Revenue to favor Public Service Commission with his opinion regarding the efficiency of Natives in this Department.

No. 3063 Mis., dated Madras, the 26th November 1887.

From the Secretary to the Commissioner of Revenue Settlement, and Director, Department of Land Records and Agriculture, Madras,—to the Secretary to the Public Service Commission, Calcutta.

Referring to your telegram dated the 24th instant, I am directed to submit a statement shewing the names and nationalities of officers of the Settlement Department drawing salaries of more than one hundred rupees per mensem.

2. I am further to add that, in the opinion of the Board's Third Member, suitable Native gentlemen can be found for all posts in the Department.

3. The Agricultural and Cattle-disease Departments are also under the Third Member He thinks that, whilst most of the improvements in agriculture and the treatment of cattle-diseases are novelties which must be imported from outside, the immediate heads of the Agricultural and Cattle-disease Departments ought to be Europeans educated in Europe.

Statement showing the Names and Nationalities of the several Officers in the Revenue Settlement Department drawing more than Rs. 100 per mensem.

	Name.	Rank.	Pay.			Nationality.	Remarks.
			R	a.	p.		
1	*W. Wilson, Esq., C.S.*	*3rd Member, Board of Revenue, and Commissioner of Revenue Settlement, and Director, Department of Land Records and Agriculture.*	3,000	0	0	*European*	*On furlough to Europe for 2 years from 18th March 1886.*
	J. Grose, Esq., C.S.	Acting do.	...			Do.	
2	P. Rajaratna Mudaliar, Rai Bahadur	Secretary	1,000	0	0	Hindu	Also supervises the Statistical Branch.
3	J. H. M. Core, Esq.	Deputy Commissioner, Revenue Settlement, No. I Party, Bellary.	1,100	0	0	European.	
4	Col. C. J. Stuart	Deputy Commissioner, Revenue Settlement, No. II Party, Vizagapatam.	1,200	0	0	Do.	
5	G. P. Clerk, Esq.	Deputy Commissioner, Revenue Settlement, No. III Party, Madura.	700	0	0	Do.	
6	J. Lakshmikanta Row, Dewan Bahadur	Deputy Commissioner, Revenue Settlement, No. V Party, South Arcot.	750	0	0	Hindu.	
7	A. E. Castlestuart Stuart, Esq., C.S.	Special Assistant, Revenue Settlement, No. VI Party, Nilgiri and Wynaad.	1,166	10	8	European.	
8	S. Ranga Chariar	Assistant Commissioner, Revenue Settlement, No. III Party, Madura.	550	0	0	Hindu.	
9	T. Krishnamurti Aiyengar	Assistant Commissioner, Revenue Settlement, No. I Party, Bellary.	550	0	0	Do.	

Establishment attached to the Settlement Parties.

	Name.	Rank.	Pay.	Nationality.	Remarks.
			R a. p.		
10	M. Venkaji Pantulu	Uncovenanted Assistant, No. I Party, Bellary.	250 0 0	Hindu.	
11	M. Narsimhulu Pantulu . . .	Uncovenanted Assistant, No. II Party, Vizagapatam.	250 0 0	Do. .	On Privilege leave.
12	M. Krishnasami Aiyengar . . .	Uncovenanted Assistant, No. III Party, Madura.	250 0 0	Do.	-
13	M. Bhanuvayya	Uncovenanted Assistant, No. V Party, South Arcot.	250 0 0	Do.	
14	C. Sankuni Menon	Uncovenanted Assistant, No. VI Party, Nilgiri and Wynaad	250 0 0	Do.	
15	K. Krishnama Chari	Supervisor, No. I Party, Bellary.	150 0 0	Do.	
16	M. Sabba Row	Supervisor, No. II Party, Vizagapatam	150 0 0	Do. .	Acting.
17	T. Sesha Aiyer	Supervisor, No. III Party, Madura.	150 0 0	Do.	
18	K. Desika Chari	Supervisor, No. V Party, South Arcot.	150 0 0	Do.	
19	A. Ramayya	Supervisor, No. VI Party, Nilgiri and Wynaad.	200 0 0	Do. .	Acting. Permanent Supervisor of No. II Party.

Establishment attached to the Board's Office.

20	M. Adinarayana Iyah . . .	Registrar . .	400 0 0	Hindu.	
21	P. Srinivasa Row	Manager . .	200 0 0	Do.	

MADRAS;
26th November 1887.

P. RAJARATNA-M,
Secretary.

Statement showing the Names and Nationalities of the several Officers in the Agriculture and Cattle-disease Departments drawing more than Rs. 100 per mensem.

	Name.	Rank.	Pay.	Nationality.	Remarks.
			R a. p.		
		Agriculture.			
1	C. Benson, Esq.	Assistant Director .	850 0 0	European.	
2	P. S. Ganapati Aiyer . . .	Head Accountant .	250 0 0	Hindu.	
3	K. Ramanuja Chari	Accountant . .	175 0 0	Do.	
4	N. Krishnasami Mudaliar . . .	Superintendent, Correspondence Section.	150 0 0	Do.	
		Cattle Disease.			
1	*Vacant*	Inspector . .	...	...	Mr. Mills having resigned, this appointment is now vacant. The salary is not fixed.
2	Mr. W. Shunker	Deputy Inspector .	300 0 0	Eurasian.	

MADRAS;
26th November 1887.

P. RAJARATNA-M,
Secretary.

APPENDIX B

TO

MADRAS REVENUE SURVEY.

Telegram dated 29th November 1887.

From the Secretary to the Public Service Commission, to the Secretary to the Government of Madras.

Kindly state if Forest Settlement Deputy Collectors are all Statutory Natives. What have been their previous services; and to what extent their work is supervised.

Proceedings No. 7363, dated 1st December, of the Revenue Department, Government of Madras.

All the Deputy Collectors who are employed on Forest Settlement work are Statutory Natives of India. They discharge their duties under the orders of the Collectors, who are required to see that the work progresses without unnecessary delay. A monthly progress report is also submitted to the Board of Revenue.

2. The registers of claims kept up by Forest Settlement Officers are submitted with the final Notification (under Section 16 of the Forest Act), and are scrutinized by the Board and Government. These registers and the accompanying reports show the time occupied in conducting the settlement, and any delay in the completion of the work has to be explained.